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*Understanding and
Reducing the Costs of
FORSCOM Installations*

*Joseph G. Bolten, John M. Halliday,
Edward G. Keating*

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PREFACE

This publication details the results of a fiscal year 1995 (FY95) research project on the costs of base operations at FORSCOM installations conducted for Commanding General, U.S. Army Forces Command (FORSCOM). The results of this project were conveyed to the Commanding General and his staff on October 2, 1995. This publication provides the background and details for that briefing.

The research was conducted in the Military Logistics Program of RAND's Arroyo Center, a federally funded research and development center sponsored by the United States Army. This report should be of interest to all Army personnel and offices concerned with the costs of operating installations.

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SUMMARY

RAND was tasked to examine the costs of operating Forces Command (FORSCOM) installations and to consider how these costs might be reduced. We approached this problem in three ways. First, we examined expenditure data for base operations at the major FORSCOM installations and attempted to develop a general cost model. Second, we interviewed garrison personnel about cost-reduction efforts, reengineering approaches, and Installation XXI initiatives. Third, we investigated the relative costs and benefits of contracting functions at installations instead of providing them with civilian employees.

INSTALLATION EXPENDITURE PATTERNS VARY CONSIDERABLY

We were unable to develop a suitable model of base operating costs for several reasons. Installation expenditures do not correlate well with gross installation characteristics, either at the level of total expenditures or at lower levels of aggregation. Our visits to FORSCOM installations confirmed this pattern of considerable heterogeneity across installations in base operating expenditures.

Some of this heterogeneity is quite understandable, given that installations have different missions, locations, and infrastructures. For example, Fort Drum has predominantly new facilities, while Fort Campbell has a large amount of World War II wood. Although we expected different spending patterns, some of the variations were quite surprising. For example, Fort McPherson appropriates more than ten times as much per soldier for libraries as does Fort Bragg. Also, Fort Sam Houston's Troop Issue Support Activity (TISA) costs roughly as much as that of the much larger Fort Stewart.

Comparison of expenditure patterns across installations must be done carefully. A number of factors can obscure or confuse the results, including uncertainties introduced by the Army's accounting system. Because the current system does not facilitate determination of the cost of activities, it can be difficult to make valid comparisons or statements about their relative costs at different installations.

In light of the considerable differences across installations, it may be difficult for FORSCOM to apply or enforce centrally imposed mandates of spending levels. However, if it plans and oversees the program carefully, FORSCOM might be able to use benchmarks for the installations' base operations functions and to evaluate installation supplemental funding requests in light of the comparative costs.

REENGINEERING APPROACHES VARY IN SUCCESS

FORSCOM installations are pursuing a number of interesting cost-reduction efforts. Installations in the XVIII Airborne Corps (Fort Bragg, Fort Campbell, Fort Polk, Fort Drum, and Fort Stewart) were tasked to "re-engineer" by pursuing avenues such as greater coordination with local communities, consolidation, process modifications, and activity streamlining. Though definitive evidence is not yet available, preliminary indications are that savings may result from these approaches. The difficulty for the Army will be to realize the full long-term benefits from any changes. For example, reengineering may free up warehouse space, but other Army users may quickly occupy the space, limiting or eliminating overall savings from reengineering.

In contrast, III Corps installations (Fort Carson, Fort Hood, Fort Irwin, and Fort Riley) were tasked to examine a "megainstallation" approach under Installation XXI. Personnel in the III Corps expressed many reservations about this direction. The benefits of centralization at Fort Hood were uncertain, and there seemed to be some large offsetting costs for communications. Further, past experiences with consolidation and the subinstallation approach have raised issues that need to be addressed before proceeding. Our understanding is that FORSCOM has currently shelved this concept.

To the extent greater installation consolidation is cost-effective, the Army should consider approaching it indirectly. For example, installations might compete against one another for Centers of Excellence as under the Integrated Sustainment Maintenance (ISM) program, and customers could purchase desired services from the most cost-effective installations.

CONTRACTING PROVIDES BENEFITS, BUT IS NOT A PANACEA

Contractors already have significant roles in the operation of most installations. Many functions are already contracted at most bases, including food service, laundry, family housing maintenance, and a number of engineering services. One objective of this work was to examine the advantages and disadvantages of contracting. We particularly focused on the major BASOPS contract at Fort Carson and contracting in the Directorate of Logistics at Fort Riley. We found that personnel at these installations feel these contracts are working well. In particular, they believe they are receiving better service than was true when these functions were provided by government employees. These individuals felt, however, that these contracts did not save money so much as they improved service. Our analysis of cost data failed to find great cost savings from these or other contracts. Cost savings may occur,

particularly over time, but the limitations of the Army accounting system restrict the analysis.

Experience at Carson, Riley, and elsewhere suggests that current government procedures to privatize existing functions (e.g., Office of Management and Budget Circular A-76) inhibit further contracting. The competitive procedures are lengthy, labor intensive, and expensive, particularly for functions that displace more than 10 workers. Although it is possible to contract functions piecemeal to avoid some of the more difficult aspects of the A-76 process, this approach has its own problems. If FORSCOM and the Army desire more contracting of installation functions, it will be necessary to simplify or revise the A-76 process.

ISSUES WITH INSTALLATION MANAGEMENT POLICIES

From the installation's perspective, many actions taken by higher headquarters, be it in Atlanta or Washington, D.C., are counterproductive. Various stovepipes, such as child development services, the Army Continuing Education System (ACES), and civilian personnel regulations impose constraints and requirements on installations. Installations can be caught between desires to reduce or reprogram overall expenditures and contrary pressure by stovepipes. The directives of different organizations can directly conflict. For instance, until recently, the Army Deputy Chief of Staff for Operations (DCSOPS) required that installations keep High Frequency Military Affiliate Radio Stations (HF/MARS) open, while FORSCOM headquarters removed all funding for such stations.

Beginning in FY96, FORSCOM installations will be operating under a civilian pay cap for directly funded garrison personnel. Some of the installations have been uncertain how to prepare for the pay cap because the policy was not clearly defined early in the summer when budgets were being prepared. The pay cap may also adversely affect overall Army objectives, depending on how it changes installation operations. For example, it could interfere with the efficient, long-run implementation of the ISM program in the Army. It will also force the installations to increase contracting of functions, with limited time to prepare, although such contracting may be more expensive for the Army and the government in the long run.

Extending the pay cap to reimbursable work in the future could also create uncertainty. Other Army policies have been increasing the amount of reimbursable work that the garrisons perform for Army Reserve Commands (ARCOMs) and tenant organizations. If this work falls under a pay cap, it may force these customers to use other options, which may be more costly or less effective for them. Moreover, if other Army commands do not coordinate their policies with FORSCOM, in the future FORSCOM

installations may send work to civilian employees in the Training and Doctrine Command (TRADOC), the Army Materiel Command (AMC), or the United States Army Corps of Engineers (USACE), with no net savings in civilian workers across the Army.

The Centers of Excellence (COEs) developed under ISM may also be faced with misaligned incentives. Under ISM, units and installations may reduce operation and maintenance (OMA) costs by using COEs to repair items. These savings may generate pressure to expand repair capabilities, increasing costs and possibly duplicating existing capabilities at other installations or at the depots. Excess capacity will mean that some facilities are underutilized and will lead to inefficiency and reduced savings for the Army as a whole. For the Army to realize the maximum savings from ISM, any excess capacity must be eliminated and overall repair efficiency must increase.

RECOMMENDATIONS

We believe FORSCOM headquarters should reorient its role in installation management. Instead of engaging in day-to-day or detailed management of installations, FORSCOM headquarters should consider serving more as an advocate and resource for installations to draw upon.

There are opportunities for FORSCOM headquarters to assist installations. For example, installations could benefit from improved information flow. We saw numerous examples of how one or more installations had solved problems currently being confronted at other locations. Moreover, in A-76 competitions and contract development, successful installation experience should be conveyed more effectively to other installations.

The decentralized reengineering efforts like the XVIII Corps effort are more likely to be successful in the long run than the "megainstallation" approach. Centralization of some functions may be cost-effective, but it might best be approached indirectly, through use of Centers of Excellence and competition among installations.

FORSCOM should be aware that some of its policies may not align incentives with overall Army policy objectives. Policies like pay caps can give rise to perverse or counterproductive behavior, especially if not coordinated with the Department of the Army (DA) and other major commands.

FORSCOM should also consider serving as an advocate for the installations in conflicts involving Department of the Army and stovepipe regulations. In some situations the installations are confronted with too many conflicting regulations. Installations will ultimately provide the services that their units and tenant activities demand and require.

They need to have the flexibility and incentives to provide these services in the most efficient manner.

FORSCOM should push to have contracting procedures simplified. The current A-76 contracting process is onerous and laden with delays, and will impede efforts to reengineer and reduce the number of civilian employees.

FORSCOM might also wish to consider its personnel assignment policies for installation management positions. Military personnel cycle through these positions with alarming rapidity. It is difficult for garrison commanders and directorate heads to learn their jobs and become effective managers in two years or less. At the same time, civilian pay caps and restrictions on high-grade personnel limit civilian management. This exacerbates the problem of transient upper-level management in the garrisons. The only obvious solutions to this problem are either longer military tours or more upper-level (deputy director) civilian management of installations.

Finally, FORSCOM should push the Army to acquire an effective cost accounting system. The current Army accounting system does not easily provide information about the real costs of activities or functions. In the short run, the Army might choose to focus on a few functions to identify installations that are performing particularly well or poorly. A coordinated cost analysis effort might be more efficient than having each installation attempt such endeavors alone. Over the long run, however, a new cost accounting system would improve the quality of installation management and decision making.

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ABBREVIATIONS

ABC	Activity Based Costing
ACCRA	American Chamber of Commerce Researchers' Association
ACES	Army Continuing Education System
ACS	Army Community Service
AFH	Army Family Housing
AMC	Army Materiel Command
AMSCO	Army Management Structure Code
AR	Army Regulation or Army Reserve
ARCOM	Army Reserve Command
ASP	Ammunition Supply Point
BAQ	Basic Allowance for Quarters
BASOPS	Base Operating Support
BRAC	Base Realignment and Closure
CBO	Congressional Budget Office
CDC	Child Development Center
CFSC	Army Community and Family Support Center
COE	Center of Excellence
COL	Cost of Living
CONUS	Continental United States
CPO	Civilian Personnel Office
CPW	Center for Public Works
DA	Department of the Army
DCA	Directorate of Community Activities
DCSOPS	Army Deputy Chief of Staff for Operations
DFAS	Defense Finance and Accounting Service
DMDC	Defense Manpower Data Center
DoD	Department of Defense
DOIM	Directorate of Information Management
DOL	Directorate of Logistics

DPCA	Directorate of Personnel and Community Activities
DPTM	Directorate of Plans, Training, and Mobilization
DPW	Directorate of Public Works
DRM	Directorate of Resource Management
DS/GS	Direct Support/General Support
FCC	Family Child Care
FORSCOM	Forces Command
FTE	Full Time Equivalent
FY	Fiscal Year
GAO	General Accounting Office
GE	General Electric
GFOQ	General and Flag Officer Quarters
GS	General Schedule or General Support
GSA	General Services Administration
HF/MARS	High Frequency Military Affiliate Radio Station
HW	Hazardous Waste
IM	Information Management
IRON	Inspect and Repair Only as Necessary
ISC	Information Systems Command
ISM	Integrated Sustainment Maintenance
ITAM-LCTA	Integrated Training Area Management Land Condition Trend Analysis
ITAM-LRAM	Integrated Training Area Management Land Rehabilitation and Maintenance
ITO	Installation Travel Office
MACOM	Major Command
MCA	Military Construction Account
MCB	Manage Civilians to Budget
MTMC	Military Traffic Management Command
MWR	Morale, Welfare, and Recreation
NAF	Nonappropriated Fund
NG	National Guard

OMA	Operation and Maintenance, Army
OMB	Office of Management and Budget
OSD	Office of the Secretary of Defense
PAE	Pacific Architects and Engineers
PW	Public Works
RPM	Real Property Maintenance
RX	Reparable Exchange
SARPMA	San Antonio Real Property Maintenance Area
TDA	Table of Distributions and Allowances
TDY	Temporary Duty
TOE	Table of Organization and Equipment
TRADOC	Training and Doctrine Command
TISA	Troop Issue Support Activity
UAP	Unaccompanied Housing
USACE	United States Army Corps of Engineers
USAR	United States Army Reserves
VERA	Voluntary Employee Retirement Account
VHA	Variable Housing Allowance
VSIP	Voluntary Separation Incentive Program
WWII	World War II

1. INTRODUCTION

BACKGROUND

The U.S. Army Forces Command (FORSCOM) is facing a number of challenges this year and in the future. These challenges include reductions in force structure, realignment and closure of bases, and the movement of units and flags between installations. Perhaps the biggest challenge, however, is the continuing reduction in operating budgets for units and installations.

In fiscal year 1994 (FY94), FORSCOM spent more than \$1.4 billion on base operations, family housing, and real property maintenance. Even so, this funding did not reveal the true operating costs of the installations. For example, neither depreciation and capital costs nor the costs of military labor at installations are included in the \$1.4 billion.

In the past the garrisons at FORSCOM installations have most often dealt with reductions in operating budgets by asking directorates to take "salami slice" cuts. In other words, the overall reductions have been allocated as more-or-less uniform percentage reductions in the current funding levels for each directorate. These budget cuts have generally been absorbed by

- encouraging voluntary retirements and retirement incentive programs,
- reducing allowable overtime,
- releasing temporary workers,
- eliminating vacant positions and transferring duties through reorganization,
- instituting reductions in force (RIF), and
- reducing contract purchases.

Through the years such tactics have reduced workforces consistently, so that most garrison personnel now feel that uniform cuts are no longer possible. Other approaches will be needed, including reducing services and eliminating functions. Unfortunately, in the past when installations made the effort to reduce operating costs voluntarily, they received no credit for these efforts in later rounds of "salami slice" reductions across installations.

It is clear that the budget for base operations will continue to be reduced in future years. This will put heavy pressure on the installations to reduce their operating costs immediately and over the long term. When combined with the drawdown and movement of units, such budget reductions will undoubtedly force the installations to make major changes in their operations.

To address this problem, FORSCOM has introduced two programs at its installations. The first initiative, Installation XXI, emphasized three different approaches to increasing efficiency, reducing costs, and improving services. Each CONUS corps was assigned a different approach to investigate. We will discuss this in more detail below. The second cost-reduction program required the installations to undertake a formal reengineering effort. All garrisons were instructed to examine their functions with the goal of reducing personnel, facilities, and inventories through process modifications, consolidation, and elimination of activities. The overall project had a strict timetable that gave the garrisons limited time in which to study the problem, analyze potential alternatives, and make decisions. At the end of the period, good ideas that had been successfully implemented could then be disseminated across all FORSCOM installations.

RESEARCH QUESTIONS

In response to these problems, the Commanding General of FORSCOM asked RAND to examine how Forces Command might reduce the operating costs of its installations. We translated this request into three basic research questions to be addressed by the study:

- What activities are supported by base operations? What do these activities cost to operate? Can the variations in these costs be explained by installation characteristics or aggregate performance measures?
- What strategies are being employed at the installations to reduce the costs of base operations? Have these strategies been successful, and do they have promise for reducing future costs?
- What lessons have the installations learned that could be applied by other installations? What role should FORSCOM play in the process of installation management? What can FORSCOM do in the future to facilitate reducing the costs of base operations?

The project did not address the fundamental question of whether or not bases should be closed to reduce future operating costs. This matter has been studied by the Army in the context of the base realignment and closure (BRAC) process and involves far more factors than costs of operation. Our goal was to understand how best to reduce the costs of installations the Army wishes to keep open.

RESEARCH APPROACH

The study approached the problem from two primary directions. First, we examined data on base operating costs and attempted to develop a simple cost model for installation

expenditures. Second, we visited a number of FORSCOM corps and division installations to discuss base operations with personnel from the garrisons. In these meetings we addressed the question of how the installations were dealing with the problem of reducing operating costs and focused on a number of more specific issues that arose during the course of the study.

Installation Cost Model

Our first approach was to collect and examine Army accounting system data relating to the expenditures for base operations at a number of FORSCOM installations. We acquired operating cost data for fiscal years 1993 and 1994 for several appropriations, disaggregated in a number of ways to facilitate the analysis. These data covered the costs of base operations and family housing at the installations, but did not include military pay and allowances. They also did not include revenues from nonappropriated funds (NAF) generated within the Army's morale, welfare, and recreation activity programs.

We aggregated these data in different ways and compared expenditures for different functions at the various installations. We also attempted to develop a simple model of the base operating costs at installations, using the characteristics of the installations and their forces as the explanatory variables. From our analysis, however, we discovered that such a model would be difficult, if not impossible, to develop for a number of reasons. We discuss this analysis and our results in Section 2.

Cost-Reduction Approaches

When visiting the installations, we intended to focus primarily on what they had done, were currently doing, or planned to do in the future to reduce operating costs. Cost reductions can be accomplished in several ways. We described earlier the historical approach of taking "salami slice" reductions across the board. This approach, although relatively easy to implement, has proved to be unpopular and can create an inefficient allocation of resources over the long run. Although installation personnel have not particularly wanted to use "salami slices" in recent years, there have often been few alternatives.

As budgets and personnel levels have fallen, it has become increasingly difficult to continue proportional reductions. Most installation personnel now seem to feel that the Army needs to begin eliminating functions or activities to make significant further reductions in operating budgets. To this end, FORSCOM recently instituted a command-wide reengineering effort in conjunction with its Installation XXI initiatives. Installations were given a strict timetable for reengineering their operations during fiscal years 1995 and

1996. At the same time, the corps were instructed to pursue their respective Installation XXI tasks, integrating these with their reengineering programs whenever possible.

Under the reengineering program the installations are supposed to consider the "radical redesign of their business processes for dramatic improvement." To paraphrase FORSCOM's official definition, this means starting from scratch instead of changing or modifying their existing ways of working. Business processes are considered to be groups of activities that create value for the customer, such as order fulfillment. Dramatic improvement means a quantum leap in performance, either a major increase in productivity or a significant improvement in process operations, or both. Reengineering is not supposed to be automation, cutting fat, downsizing, fixing, or making marginal changes. Unfortunately, in practice it may not be much more than that, as few installations have any experience with other approaches.

The installations are supposed to identify their processes, determine the clients for these processes and the reasons that they perform the related functions, and examine the activities that are part of the processes. Ideally these investigations will yield processes that are either no longer required or can be eliminated for other reasons. For those that the garrisons must, or choose to, continue performing, the reengineering efforts are supposed to produce innovative ways of improving the operations to reduce costs and increase effectiveness. In practice, FORSCOM has interpreted this to mean a number of things, including (1) simplify processes, (2) flatten organizational hierarchy and reduce the number of managers, (3) give personnel multidimensional jobs, (4) shift orientation toward the customer and his needs, and (5) emphasize performance outcomes, not activities.

Under the Installation XXI initiatives, FORSCOM has investigated ways of reducing garrison services to take advantage of the services available from local communities and other military installations. The XVIII Airborne Corps, headed by Fort Bragg and including Forts Stewart, Drum, and Campbell, has studied reengineering systems to improve business practices and increase efficiency through service partnerships with local government, private, and state organizations. Fort Hood, as the headquarters for III Corps, has examined reengineering base operations organizations through regionalization across the corps. The central concept would create one hub installation (Fort Hood) with a number of satellite installations (Fort Carson and Fort Riley). Base operations would be consolidated at the hub, with the possible creation of centers of excellence for different functions at the satellites. Fort Lewis, as the headquarters for I Corps, has explored the role of interservice or joint service support for base operations with the Air Force and Navy. They are working with the staff at the collocated McChord Air Force Base to study the prospects of future agreements in

services such as medical care, fire and police protection, and housing. Finally, the Army Reserve Command, USARC, has been tasked to determine the feasibility and potential costs of their providing all off-post support to Army customers.

Although two other approaches to reducing costs may not fall directly under the reengineering umbrella, they have a close relationship both to reengineering and to each other. They are (1) alternative means of promoting competition among organizations, and (2) contracting out functions instead of providing them with government civilian employees. Current regulations and policies have generally precluded installation organizations from competing for business outside the installation. For example, the civilian personnel office at Fort Carson would not seek to, nor be able to, provide reimbursable services to organizations at Fort Hood or Fort Riley. Enabling and encouraging such competition might improve the efficiency of all civilian personnel offices.

Similarly, the contracting of functions with private business is a form of competition with civilian employees on the bases. This competition has been formalized in the A-76 Commercial Activities process, which installations must follow when the desired contracting eliminates federal civilian jobs. The process has been used extensively at the installations, but can be lengthy, complicated, and expensive for large functions. Various installations have had more or less success in their contracting efforts.

For a few years, installations have been selling services to the local community to generate small amounts of revenue. Examples include hunting and fishing privileges, lumber harvesting, and farming leases. There may be opportunities in the future to expand some of these services if potential problems of unfair competition and inhibiting policies can be surmounted.

Finally, in an effort to reduce the costs of civilian personnel, the Army and FORSCOM in particular have imposed a civilian pay cap on garrison personnel in FY96. This pay cap directly limits total civilian salaries, including overtime and temporary workers, for nonreimbursable labor. Although this policy can be implemented at the installations in any way they desire, it seems to have become another example of the "salami slice" approach.

Installation Visits

To assess how the installations had responded historically and planned to respond to budget problems and to reduce their short-term and long-term operating costs, we visited a number of major FORSCOM bases, including Forts Bragg, Campbell, Carson, Hood, Riley, and Stewart, as well as FORSCOM headquarters at Fort McPherson in Atlanta. At these installations we met with personnel from the Garrison Commander's Office and the

Directorates of Information Management (DOIM); Logistics (DOL); Personnel and Community Activities (DPCA); Plans, Training, and Mobilization (DPTM); Public Works (DPW); and Resource Management (DRM).

In our meetings we wanted to learn also how the installations were responding to the FORSCOM reengineering and Installation XXI initiatives and to the civilian pay cap to be imposed in FY96. We asked individuals not only for their views of current issues, but also their opinions about how the system might evolve differently and be improved in the future. We made every effort to let interviewees raise issues they felt were important, rather than our trying to direct the conversation.

We also discussed installation experience with contracting base support functions. We wanted to know the advantages and disadvantages of contracting, whether or not it saved money compared to the alternatives (government civilian or military personnel), and the history of how the various functions had been privatized. In particular we also wanted to find out what mistakes had been made or lessons learned that might prove to be useful in future contracting operations at all of the installations.

ORGANIZATION OF THE REPORT

In the next section, we address the problem of developing a model for installation base operating costs. Because such a model proved to be infeasible, the section consequently discusses the considerable diversity we observed across FORSCOM installations, both on this year's and last year's travels and through analysis of the DMDC data. Following that, in Section 3, we describe some of the cost-reduction efforts that are currently ongoing within FORSCOM. These include the reengineering efforts being sponsored by FORSCOM as well as the programs under the Installation XXI initiative, including the hub/satellite centralization proposals. Section 4 considers the general question of contracting base operations functions, including the contracting efforts that have occurred at the Fort Carson Directorate of Public Works and the Fort Riley Directorate of Logistics. We discuss the advantages and disadvantages of contracting and the possible applicability of these experiences to other installations. In Section 5 we address concerns with headquarters' installation management policies and discuss a recurring problem of misaligned incentives. This discussion concludes that FORSCOM and the Army should more carefully consider unit and installation incentives in developing long-term policies. Finally, we present our conclusions and recommendations.

2. CAN WE MODEL BASE OPERATIONS EXPENDITURES?

FORSCOM INSTALLATIONS

FORSCOM installations differ widely on a number of dimensions including size, forces, location, mission, history, infrastructure, climate, environment, and the characteristics of the surrounding population and economic area. From a military viewpoint the primary dimensions are force structure and mission. Eight installations have forces from at least part or all of one or more maneuver divisions. Three of these additionally have corps headquarters: Fort Lewis (I Corps), Fort Hood (III Corps), and Fort Bragg (XVIII Airborne Corps). FORSCOM also includes five major nondivisional bases with different missions: (1) Fort McPherson (FORSCOM headquarters), (2) Fort Irwin (National Training Center), (3) Fort Polk (Joint Readiness Training Center), (4) Fort McCoy (reserve training), and (5) Fort Sam Houston (medical command training). Many of these installations have smaller subinstallations and separate training areas assigned to them. The FY94 subinstallation relationships are shown in Table 2.1.

Note that in FY95 some of these relationships changed. Fort McCoy moved from FORSCOM to the Reserve Command. At the same time it acquired Camp Parks, Fort Hunter Liggett, and Fort Pickett as subinstallations.

Table 2.1
FY94 Subinstallations and Training Areas

Type	Installation	Subinstallation(s) and Training Areas
Corps	Bragg	Pickett
	Hood	None
	Lewis	Hunter Liggett, Oakland Army Base, Camp Parks, Presidio of San Francisco, Vancouver Barracks, Yakima
Division	Campbell	None
	Carson	Piñon Canyon
	Drum	Indiantown Gap, Kelly Support Facility
	Riley	None
	Stewart	Hunter Army Airfield
Nondivisional	Irwin	None
	McCoy	None
	McPherson	Buchanan, Gillem
	Polk	None
	Sam Houston	Camp Bullis

The installations differ in other ways that seem to affect directly the costs of base operations. Climate may be important for a number of reasons. For example, Forts Carson and Drum may have relatively harsh winters, whereas Fort Stewart has a semitropical climate. The age of the installation infrastructure may also be important. Fort Drum has very new infrastructure; Fort Campbell has very old infrastructure; Fort Sam Houston has more than half of its building area in historical structures. The types of units will also influence training and other facilities. Thus, forts with predominantly heavy units, such as Carson, Hood, Riley, Stewart, and Lewis, may have different requirements than those with lighter units, including Bragg, Campbell, and Drum.

Location has particular relevance for a number of reasons. Installations such as Fort Carson and Fort Lewis are located in large urban areas. While these urban centers may provide more opportunity for family housing (albeit usually at higher cost), spousal employment, and morale, recreation, and welfare (MWR) activities off-post than a Fort Riley or Drum, they may also make training more difficult on the installation itself. Accordingly, both Carson and Lewis have acquired separate training sites in rural areas.

Location also affects base operations through the availability, quality, and cost of off-post services, including utilities and waste disposal of all types. The requirements for the appropriate installation infrastructure (electricity, natural gas, oil, water, waste water treatment, and solid waste disposal, for example) will depend, at least in part, on the availability, capacity, and price of local utility systems. Fort Drum leases an electric generating plant because the local area did not have sufficient capacity to support the installation. Fort Riley, on the other hand, has been investigating whether or not it can sell its excess water plant capacity to local communities in order to generate additional operating funds for the installation.

Finally, location will also affect the availability of personnel for work on the installation or businesses to perform contract services. Some bases have a potentially larger supply of skilled temporary workers. Others, in urban areas, have a wider variety and selection of businesses from which to select contractors. Moreover, some installations such as Fort Dix and Camp Parks have access to prison labor to supplement their work forces.

Current FORSCOM installations also differ greatly in size and in the age of their infrastructure. Larger size seems to produce economies of scale for some functions as well as providing more military personnel who can be assigned temporarily to base support functions. The age and quality of post infrastructure, on the other hand, should affect maintenance and repair costs and priorities. In the long run, it will also determine the installation's ability to privatize its utility systems without major capital investments. The

potential requirement for large capital investment may also drive base closure and future stationing decisions.

EXPENDITURES FOR BASE OPERATIONS

We originally intended to develop an aggregate cost model of expenditures for installation base operations. We anticipated that many, if not most, of the categories of expenditures could be reasonably well explained using characteristics of the installations, such as their military and civilian populations, land area, and building area.

To develop a consistent, detailed data base of these expenditures, we gathered data from the installations that we visited and from the Defense Manpower Data Center (DMDC). We focused on operating expenditures at the thirteen primary FORSCOM installations for FY93 and FY94, including the OMA, OMNG, OMAR, and AFH appropriations. We did not attempt to obtain data for smaller installations such as Fort Devens, Fort Dix, and Fort Hamilton. Because the Army accounting system does not make the distinction, the expenditures of divisional and nondivisional installations are aggregated with those of all of their subinstallations.

Total Expenditures

We initially examined total expenditures for base operations and support. These results are summarized in Table 2.2 and Figures 2.1 and 2.2, which present FY94 direct (nonreimbursed), appropriated base operation expenditures at the divisional installations (including subinstallations) and the five nondivisional bases. This information does not include capital expenditures, e.g., military construction (MCA appropriation), or nonappropriated fund (NAF) expenditures, but it does include Army family housing (AFH) costs and the costs of real property maintenance (RPM). Similarly, although these data do not include any mission funds, medical expenditures, or reimbursable expenditures, they do include direct reserve support funding on the installations.

Table 2.2 includes not only total expenditures but also the expenditure per soldier, derived from the permanent military population. It is clear that expenditure per soldier varies significantly across the installations, indicating that other factors strongly influence total costs. Of course, expenditure per soldier may be a misleading metric for installations without large permanent populations. A better measure might be annual military manpower days. Unfortunately, we could not find a current, accurate, and consistent tabulation of annual military manpower days.

Table 2.2
Overview of FY94 Expenditures

Installation	Total Direct Expenditure (millions)	Military Population	Expenditure per Soldier	Price Index ^a	COL corrected Expenditure
Bragg	192.0	44,503	4,315	95.8	4,504
Campbell	95.6	22,658	4,218	90.4	4,666
Carson	91.8	13,930	6,593	98.9	6,666
Drum	144.1	14,887	9,682	104.2	9,292
Hood	170.4	44,421	3,836	95.1	4,034
Lewis	150.6	21,568	6,981	103.0	6,778
Riley	92.1	13,135	7,013	93.7	7,485
Stewart	90.9	19,149	4,746	97.3	4,878
Irwin	77.2	4,792	16,115	114.5	14,074
McCoy	75.7	1,017	74,407	103.3	72,030
McPherson	108.5	2,913	37,254	100.6	37,032
Polk	86.8	9,206	9,425	95.6	9,859
Sam Houston	90.8	7,827	11,598	97.4	11,907
Total ^b	1,466.5	220,006	6,666	NA	NA

SOURCES: Defense Manpower Data Center and the American Chamber of Commerce Researchers' Association (ACCRA).

^aThe cost of living data are the American Chamber of Commerce Researchers' Association (ACCRA) Cost of Living Indices for the 1st quarter 1994, except Fort Stewart, whose index is from the 3rd quarter of 1991, and Fort Irwin, whose index is from the 3rd quarter of 1994. The index is for the installation's main location; subinstallations are not considered. The Fort Drum index is for Syracuse, New York. The Fort Irwin index is for Riverside, California. The ACCRA Cost of Living Index for an area is derived by computing the price of a "typical" bundle of goods. The United States average is standardized to 100.

^bNote that "Total" applies only to the listed installations and their subinstallations. Fort Devens, Fort Dix, and Fort Hamilton are not included.

Figure 2.1 displays the same total direct expenditures by installation as a pie chart. This figure also illustrates a conclusion that can be seen in Table 2.2—that base operating costs across installations vary far less than what you would expect, looking solely at military populations. Note that although Forts Bragg and Hood have between them 40 percent of the total population of these installations, they represent only 26 percent of the base operating costs.

Figure 2.2 plots the total direct expenditures of the thirteen installations against their military populations (see Table 2.2). Although there is a clear tendency for more populous installations to spend more, the graph also shows examples of similarly sized installations with widely different total direct expenditures (e.g., Drum and Carson) and of installations

with similar total direct expenditure levels but widely different populations (e.g., Sam Houston and Stewart).

To develop a more accurate model, we first tried to understand the source of some of the differences shown in Table 2.2 and Figure 2.2. Fort Drum's costs per soldier are markedly higher than those of any other divisional post, even correcting for the cost-of-living factor.¹ However, the 10th Mountain Division from Fort Drum deployed forces overseas during FY94. It appears that an unknown fraction of the deployment and subsequent operating costs (associated with base operations functions) has been included in the figures. We cannot separate them from the normal operating costs except by comparison with other recent years. Unfortunately, the costs for FY93 are also contaminated by deployment of some of the division. Accordingly, it is difficult to conclude that the actual base support costs for Fort Drum are that much higher than those of other installations.

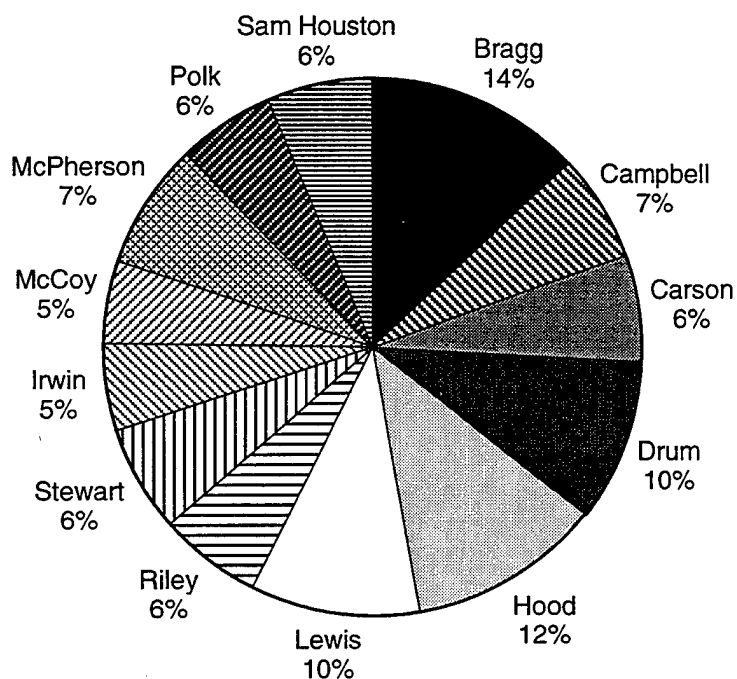


Figure 2.1—FY94 Total Direct Expenditures by Installation

¹After Table 2.2, all numbers presented are nominal. One could correct the other tables and the figures for cost-of-living differences, but these differences are not great across the installations. Further, as a policy matter, the government is interested in cost minimization, not cost-of-living-adjusted cost minimization.

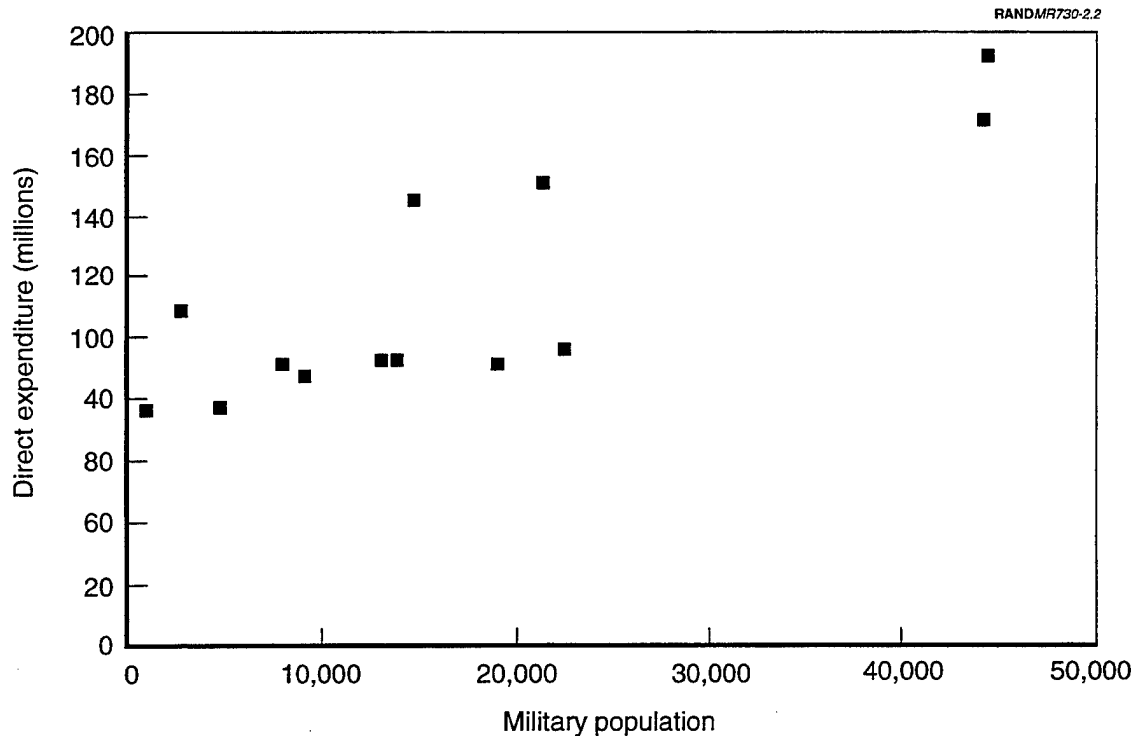


Figure 2.2—FY94 Military Population vs. Total Direct Expenditures

Installation mission can also affect the results shown in Table 2.1 and Figure 2.2. Fort McCoy, most notably, has a reserve training mission with a limited number of permanently assigned soldiers. Fort Polk and Fort Irwin also have predominantly training missions, although they have larger resident military populations. Similarly, Fort Sam Houston conducts extensive medical training throughout the year. As a consequence, all of these installations will have large transient populations that would not be included in the military population of the post, but would add to base support costs.

Fort McPherson, as the FORSCOM headquarters, represents another installation that might have complicating influences. It is difficult to determine from the Army accounting system how much of the apparent base support costs of the installation may actually be FORSCOM-wide expenditures that flow through McPherson's accounts and are not separated after the data leave the installation.

Categories of Expenditures

To better understand the variations in the data in Table 2.2, we looked at the detailed expenditures by function. The accounting system specifies expenditures for functions or activities by AMSCOs (Army Management Structure Codes). Unfortunately, the correspondence

between AMSCOs and actual activities can be obscure at times or even nonexistent. Moreover, certain functions can have expenditures in more than one AMSCO. Thus, it is essential to group AMSCOs into activities that correspond (at least roughly) to base operating functions.

Initially, we moved down one level of aggregation from total expenditures by grouping AMSCOs into seven general categories: (1) administration, (2) environment, (3) housing, (4) information management, (5) logistics, (6) personnel, and (7) public works. These categories roughly correspond to directorates within the garrisons. However, not every function is found in the same directorate across installations. For instance, family housing is generally found under DPWs, but it is within the DOL at Fort McCoy. Our category approach addresses this sort of problem. The same expenditures make up each category for each installation. The appendix explains the components of these categories. The "administration" category consolidates into one group a number of miscellaneous and administrative functions: command element, contracting, public affairs, records, resource management, training support, and civilian training.

Table 2.3 presents expenditures by category for each installation (including their subinstallations). As noted, nonappropriated fund expenditures are not considered. Figure 2.3 presents the total expenditures by category as a pie chart. Finally, to examine these expenditures for meaningful relationships, in Table 2.4 we present the expenditure per soldier for these categories at the thirteen installations.

Table 2.3
FY94 Expenditures by Category (Millions of Dollars)

Installation	Admin	Envir	Housing	Info Mgmt	Logistics	Personnel	Public Works
Bragg	13.7	11.8	23.6	11.9	42.0	24.3	64.6
Campbell	4.6	8.7	18.8	4.9	13.4	10.3	34.8
Carson	7.5	5.8	7.1	8.0	14.7	11.9	36.9
Drum	8.0	7.2	35.8	5.6	25.0	10.5	52.1
Hood	12.8	8.4	23.8	21.7	34.2	16.7	52.7
Lewis	9.8	11.8	16.6	9.1	29.2	19.4	54.8
Riley	6.8	6.9	12.9	7.0	17.8	10.0	30.7
Stewart	5.1	3.3	10.6	5.3	21.0	13.6	32.0
Irwin	7.8	7.2	8.6	5.0	16.0	7.4	25.2
McCoy	4.0	4.4	1.6	3.9	26.0	7.6	28.2
McPherson	10.2	10.6	6.2	15.1	20.2	10.6	35.7
Polk	8.6	4.8	16.1	3.9	16.0	12.9	24.4
Sam Houston	6.4	3.1	8.8	17.2	16.9	10.2	28.2
Total	105.2	94.1	190.5	118.7	292.6	165.2	500.2

SOURCE: Defense Manpower Data Center.

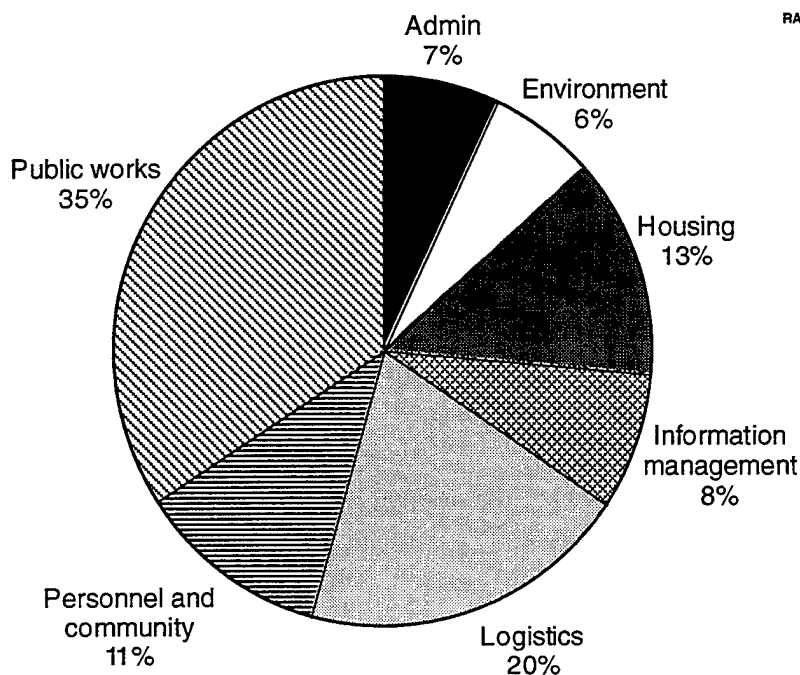


Figure 2.3—FY94 Total Direct Expenditures by Category

Table 2.4 shows little more consistency or predictability than the corresponding results for total expenditures. The five nondivisional installations seem to have fairly consistently higher expenditures per soldier for most categories, but even the expenditures for the divisional installations have high variability. Note that Fort Drum has particularly marked expenditures per soldier on public works (1.32 times as much per soldier as the next-highest divisional post, Fort Carson) and housing (2.44 times as much per soldier as the next-highest divisional post, Fort Riley). Drum's marked housing expenditures are, in part, caused by the relatively larger fraction of soldiers there who live in government-provided family housing than at other divisional installations. The high public works costs at Fort Drum come from the lease payments for the electric generating plant built on the installation.

Because the initial analysis using overall expenditures and expenditures by category had so little success, we decided to look at specific categories in more detail. The objectives of this investigation were to understand more clearly why expenditure patterns varied so widely and to determine whether or not it would be possible to develop a useful cost model for base operations expenditures. We discuss next the costs associated with Army family housing and environmental compliance.

Table 2.4
FY94 Expenditures by Category (Dollars per Soldier)

Installation	Admin	Envir	Housing	Info Mgmt	Logistics	Personnel	Public Works
Bragg	309	265	531	268	943	546	1,452
Campbell	205	382	830	218	593	455	1,535
Carson	536	414	509	571	1,057	856	2,651
Drum	536	484	2,402	378	1,682	702	3,497
Hood	289	190	537	489	770	375	1,186
Lewis	453	548	770	420	1,353	898	2,539
Riley	514	527	983	534	1,355	762	2,339
Stewart	265	174	554	278	1,096	708	1,673
Irwin	1,623	1,500	1,805	1,046	3,342	1,546	5,253
McCoy	3,890	4,328	1,574	3,856	25,558	7,506	27,695
McPherson	3,485	3,639	2,122	5,189	6,951	3,625	12,242
Polk	940	527	1,744	429	1,743	1,396	2,648
Sam Houston	816	400	1,124	2,193	2,157	1,298	3,609
Total	478	428	866	540	1,330	751	2,274

SOURCE: Defense Manpower Data Center.

Army Family Housing

Army family housing demonstrates the complications that make it difficult to develop a generalized cost model. The housing cost per soldier measure does not consider the availability of family housing at the installations. Like Fort Drum, Fort Polk and Fort Irwin should also house a relatively greater fraction of their soldier families on the installation. This can be seen in Table 2.5, which calculates the number of soldiers per family housing unit at each of these major installations in FORSCOM. With this information we can control for differences in the amount of housing by examining the Army Family Housing (AFH) expenditure per family housing unit. This information is shown in Table 2.6, which also includes the housing units column from Table 2.5.

In this table, the highest housing costs per unit occur at Forts McCoy, Drum, McPherson, and Sam Houston. Both Forts Drum and McCoy have extensive leased off-post family housing. To the extent that these leases include amortized construction costs, the housing costs would look artificially high compared to other installations. At other posts no depreciation or fraction of the construction expenditures for family housing are included in annual operating costs. The housing costs at Fort McPherson and Fort Sam Houston are probably high because both of these installations have very large, old housing units that fall under the category of historic buildings. Operation and maintenance of historic buildings

Table 2.5
FY94 Soldiers per Family Housing Unit

Installation	Military Population	Family Housing Units	Soldiers per Family Housing Unit
Bragg	44,503	5,135	8.67
Campbell	22,658	4,153	5.46
Carson	13,930	1,826	7.63
Drum	14,887	4,272	3.48
Hood	44,421	5,556	8.00
Lewis	21,568	3,587	6.01
Riley	13,135	3,180	4.13
Stewart	19,149	3,052	6.27
Irwin	4,792	1,808	2.65
McCoy	1,017	94	10.82
McPherson	2,913	476	6.12
Polk	9,206	4,006	2.30
Sam Houston	7,827	1,169	6.70
Total	220,006	38,314	5.74

SOURCES: Defense Manpower Data Center, *FORSCOM Mobilization Station Study*, and the installations.

Table 2.6
FY94 AFH Expenditure per Family Housing Unit

Installation	AFH Expenditure (millions)	Family Housing Units	Expenditure per Family Housing Unit
Bragg	23.6	5,135	4,602
Campbell	18.8	4,153	4,526
Carson	7.1	1,826	3,881
Drum	35.8	4,272	8,372
Hood	23.8	5,556	4,292
Lewis	16.6	3,587	4,633
Riley	12.9	3,180	4,058
Stewart	10.6	3,052	3,474
Irwin	8.6	1,808	4,784
McCoy	1.6	94	17,026
McPherson	6.2	476	12,988
Polk	16.1	4,006	4,007
Sam Houston	8.8	1,169	7,527
Total	190.5	38,314	4,973

SOURCES: Defense Manpower Data Center, *FORSCOM Mobilization Station Study*, and the installations.

costs far more than normal because of local regulations, restrictions, and permits. The main conclusion that we can draw from these results is that family housing costs depend on a number of factors that vary among installations and are not easily predictable from installation characteristics.

As we have said, Fort Drum's relatively high expenditures for housing and public works largely emanate from the way the installation was expanded in the early 1980s. Numerous housing units and utility services were leased rather than purchased with AFH construction funds. Hence, Fort Drum incurs an increased annual expenditure as compared to other divisional installations whose housing was purchased with military construction funds and who obtain their utilities from off-post providers. See Halliday et al. (forthcoming) for more discussion on this point.

In the long run it may be possible to reduce costs by eliminating family housing and paying all soldiers with families the applicable Basic Allowance for Quarters (BAQ) and Variable Housing Allowance (VHA) for the area. Table 2.7 compares AFH spending per housing unit to these alternative expenditures. The BAQ/VHA numbers in this table cover only the parent installation.

In most cases, the AFH per family housing unit is less than the applicable BAQ and VHA sum. However, except at Drum and McCoy, family housing was generally built with

Table 2.7
AFH vs. BAQ/VHA at FORSCOM Installations

Installation	FY94 AFH per Housing Unit	E-1 with dependents annual BAQ/VHA	E-6 with dependents annual BAQ/VHA	O-3 with dependents annual BAQ/VHA	O-6 with dependents annual BAQ/VHA
Bragg	4,602	5,162	6,622	7,918	10,405
Campbell	4,526	4,077	5,795	7,009	9,968
Carson	3,881	5,091	7,224	8,437	10,798
Drum	8,372	4,527	6,806	7,474	10,812
Hood	4,292	4,875	6,838	8,393	10,956
Lewis	4,633	5,392	7,822	9,131	11,223
Riley	4,058	4,218	5,692	7,660	9,968
Stewart	3,474	4,891	6,622	7,009	9,968
Irwin	4,784	4,997	7,359	7,650	11,432
McCoy	17,026	3,942	5,692	7,009	9,968
McPherson	12,988	5,463	7,557	8,868	11,216
Polk	4,007	3,942	5,692	7,009	9,968
Sam Houston	7,527	5,244	7,149	8,841	10,949

SOURCES: Defense Manpower Data Center and *Army Times*, January 9, 1995.

AFH construction funding, which is not included in Table 2.7. Thus, the AFH per housing unit understates the true cost of housing. Indeed, it is interesting to note that the BAQ/VHA sum was lower at Fort Drum than the AFH per housing unit for all but very high ranking soldiers. The Congressional Budget Office (1993) argued that DoD housing generally costs 35-40 percent more than comparable private sector housing. The CBO's analysis considered depreciation, capital costs, payments to local school districts to handle on-post dependents, and land charges. No such expenses are considered in the AFH per housing unit data in Table 2.7.

Of course, the Army may have other reasons for building family housing. These might include the need for rapid accessibility to the unit for deployment, higher morale, and limited or expensive alternative housing in the area.

Public Works and Environmental Compliance

Public works expenditures may be more dependent on the area of buildings rather than the number of personnel at an installation. To investigate this, in Table 2.8 we show total public works expenditures and expenditure per square foot of building area at the installations. Unfortunately, these data indicate that public works spending per square foot

Table 2.8
FY94 Public Works Expenditure per Building Square Foot

Installation	Total Expenditure (millions)	Building Square Feet (millions)	Expenditure per Square Foot
Bragg	64.6	29.4	2.20
Campbell	34.8	17.5	1.99
Carson	36.9	8.6	4.28
Drum	52.1	16.1	3.23
Hood	52.7	17.0	3.11
Lewis	54.8	25.5	2.14
Riley	30.7	8.5	3.63
Stewart	32.0	13.4	2.40
Irwin	25.2	3.4	7.40
McCoy	28.2	5.6	5.02
McPherson	35.7	10.2	3.50
Polk	24.4	16.8	1.45
Sam Houston	28.2	11.2	2.53
Total	500.2	183.0	2.73

SOURCE: Defense Manpower Data Center.

varied by more than a factor of two across the divisional posts, with Fort Carson the most costly. Fort Campbell, with its extensive World War II wood, and Fort Lewis were the least costly, although it is difficult to say why.

Among the nondivision installations, Fort Irwin and Fort McCoy were the most expensive. Note that these costs depend only on building area, so they should not be influenced by the part-time population and training status of the posts. To further confound the results, Fort Polk, also a training center, has the lowest expenditures per square foot of all major installations.

Perhaps the category "public works" is still too broad to model effectively. Instead, we consider two functions within the Directorates of Public Works (DPW), demolition and fire prevention. Unfortunately, one also sees widely varying expenditure patterns in both of these functions. For example, Table 2.9 shows that Forts Campbell and Lewis had major demolition programs in fiscal 1994. Meanwhile, Fort Carson and Fort Sam Houston spent almost nothing on demolition. Because FORSCOM and the Army have had intensive demolition programs (requirements) in recent years, these variations probably only represent differences in timing and availability of suitable WWII wooden buildings.

Table 2.9
FY94 Demolition and Fire Prevention Expenditures

Installation	Building Square Feet (millions)	Demolition Expenditure (millions)	Demolition Expenditure per 1,000 Square Feet	Fire Prevention Expenditure (millions)	Fire Prevention Expenditure per 1,000 Square Feet
Bragg	29.4	0.4	13	3.2	109
Campbell	17.5	2.6	151	1.5	88
Carson	8.6	0.1	9	2.4	279
Drum	16.1	0.5	28	2.8	174
Hood	17.0	1.4	85	3.4	198
Lewis	25.5	3.0	117	4.2	166
Riley	8.5	0.2	21	1.6	185
Stewart	13.4	0.3	20	3.1	234
Irwin	3.4	0.5	140	2.1	619
McCoy	5.6	0.2	31	3.1	552
McPherson	10.2	0.2	16	1.9	184
Polk	16.8	0.4	24	1.2	72
Sam Houston	11.2	0.0	0	1.7	155
Total	183.0	9.7	53	32.2	176

SOURCE: Defense Manpower Data Center.

The table also shows that fire prevention costs per square foot of building area (the most likely metric) varied significantly across the installations. Fort Carson spent considerably more per square foot than the other divisional posts on fire prevention, while Fort Campbell was a low-end outlier at less than one-third of the cost at Fort Carson. Among the nondivision installations, Fort Polk was even lower. Considering location, climate, and installation infrastructure, there is no clear reason for these large variations. Note, however, that even overall low-end outlier Fort Polk spent in excess of \$1.2 million on fire prevention in fiscal 1994. Clearly this may be an area where efficiencies and cost savings may be possible in the future. Further study will be needed to determine why these variations occur and whether they reflect good ideas and procedures that can be transferred from one installation to another.

To investigate the expenditures in more detail, we examine in Table 2.10 the direct environmental expenditures. This table shows both total expenditures (for compliance and program administration, including subinstallations) and expenditures per acre of land at each of the thirteen major FORSCOM installations.

Table 2.10
FY94 Environmental Expenditure per Acre

Installation	Total Expenditure (millions)	Acres	Expenditure per Acre
Bragg	11.8	187,241	63.05
Campbell	8.7	105,068	82.40
Carson	5.8	381,391	15.11
Drum	7.2	126,431	56.97
Hood	8.4	217,345	38.74
Lewis	11.8	516,963	22.86
Riley	6.9	100,695	68.73
Stewart	3.3	290,036	11.51
Irwin	7.2	642,731	11.18
McCoy	4.4	59,779	73.63
McPherson	10.6	2,648	4,003.58
Polk	4.8	198,923	24.37
Sam Houston	3.1	31,030	100.97
Total	94.1	2,860,281	32.90

SOURCES: Defense Manpower Data Center, *Army BASOPS Primer*, and *Army*, October 1994.

The level and pattern of these expenditures has no immediate explanation, particularly one related to gross installation characteristics. But because these costs are frequently driven by location, public involvement, state regulatory structure and climate, and specific compliance actions, it may be difficult to understand their variation without detailed examination of all factors (internal and external). For example, Fort McPherson (including Forts Gillem and Buchanan), at 2,648 total acres with no training facilities, spent \$10.6 million in FY94, more than any other FORSCOM installations except Bragg and Lewis.² Moreover, both Fort Bragg and Fort Stewart have an endangered woodpecker species, but Fort Stewart's expenditures are only about 30 percent of those at Fort Bragg. Examination of the detail of this category explains this apparent contradiction, by showing that almost half of the costs at Fort Bragg are related to water pollution and water quality, and only 5 percent to endangered species.

In support of this argument, FORSCOM headquarters has indicated to us that installation environmental expenditures are largely driven by Class I "Must Fund" environmental projects. These projects deal with situations in which the installations are either out of compliance or very soon to be out of compliance with federal or state regulations. Such situations can arise from many activities, including cleanup of old problems (especially hazardous waste disposal), capacity or operational problems with waste water and water treatment facilities, or normal operations in environmentally sensitive areas. In this sense, Forts Bragg and Lewis (including the Yakima Training Center) are considered to be the most environmentally sensitive division installations (and have the highest total environmental expenditures). Because of the complexity of environmental management and compliance, and the dependence of total expenditures on a multitude of factors (including installation location, forces, mission, and infrastructure), one cannot compare expenditures across installations and draw any conclusions about either the effectiveness or the efficiency of their environmental programs and management.

Because environmental compliance costs can be related to any number of problems that don't depend on total acreage, the cost per acre metric may have little meaning and must be used with great caution. Many costs (such as water pollution control or hazardous waste management) may depend more on military population, force structure, or even installation history than on the physical size of the facility. Expenditures may also depend on the willingness and the ability of the installation to deal with regulatory agencies. The information in Table 2.11 considers one aspect of that factor.

²We reiterate, however, our concern that FORSCOM-wide expenses may be flowing through Fort McPherson's account. See our discussion of Table 2.2.

Table 2.11
FY94 Personnel and Administrative Environmental Expenditure

Installation	Total Expenditure (millions)	Personnel and Administrative Expenditure (millions)	Personnel and Administrative Fraction of Total (%)
Bragg	11.8	0.7	5.7
Campbell	8.7	0.9	10.1
Carson	5.8	2.9	50.6
Drum	7.2	0.8	11.6
Hood	8.4	0.5	6.4
Lewis	11.8	1.7	14.8
Riley	6.9	2.4	34.3
Stewart	3.3	0.7	20.9
Irwin	7.2	0.6	8.9
McCoy	4.4	0.8	18.1
McPherson	10.6	1.6	15.3
Polk	4.8	0.4	8.6
Sam Houston	3.1	1.4	44.7
Total	94.1	15.5	16.5

SOURCE: Defense Manpower Data Center.

Table 2.11 compares the spending on personnel and administration within environmental programs at the installations in FY94. From the table it is clear that the expenditures for most installations are dominated by costs other than personnel and administration, which we call general compliance costs. Compliance costs include the costs of studies, monitoring, treatment, and other programs in hazardous waste management, waste water treatment, pollution prevention, endangered species, and underground storage tank management, for example.

The costs of personnel and administration can vary across installations in unexpected ways. While at most installations these costs range between 5 and 20 percent, they are 35 percent at Fort Riley, 45 percent at Fort Sam Houston, and 50 percent at Fort Carson. This variation has several possible explanations. First, if overall costs are low, the somewhat fixed costs of administration will look relatively higher compared to total spending. Forts Carson, Riley, and Sam Houston each had less than \$7 million in total environmental expenditures in FY94. Second, overall costs at these installations may be lower because the installations spend more on personnel and administration to remain ahead of potential problems and deal with regulators actively, instead of reacting to situations. In this way, they may be reducing compliance costs in the long run.

Note that the personnel and administration costs do not necessarily represent only the costs of Army civilian employees in environmental programs. These costs also include contracted personnel who may be performing the same functions (such as occurs at Fort Lewis, for example). Finally, particularly at Fort Sam Houston, extensive historical preservation activities may require relatively more personnel than other environmental problems. The limitations of the accounting system make it very difficult to determine to what extent this may be the correct explanation. It is interesting, in any case, that the installations have chosen to spend their environmental budgets in different fashions.

Child Development and Libraries

Clearly, environmental expenditures have too many influences to be modeled using aggregate installation characteristics. Other functions, however, such as those in Personnel and Community Affairs, may be more regulated and standardized and thus may produce better results. Two of these functions are libraries and child development. Child development programs, in particular, are highly regulated by the Army Community and Family Support Center (CFSC), the "stovepipe" organization for child care. These two functions should show more consistent patterns of expenditures. The results of this analysis can be seen in Table 2.12, which shows the appropriated expenditures per soldier for these functions. Note that these data do not include the sizable nonappropriated fund (NAF) expenditures in these areas. Although the NAF contributions to these programs are covered by guidelines rather than constraints or specified minimum levels, the MWR Board of Directors has instituted a standard for NAF subsidies. Despite the actions of the MWR Board, the actual NAF funding may vary significantly between installations.

The library expenditures again show extremely high variation in expenditure per soldier. Fort Lewis appropriated four times as much per soldier to libraries as Fort Hood, but most installations appear to be within a reasonably small range, at least for the appropriated component of library funding. However, Fort McPherson's library expenditure per soldier, in turn, more than triples that of Fort Lewis and is more than six times the mean. Again, however, this total may include FORSCOM money and thus may be an artifact of the Army accounting system.

Table 2.12 also shows appropriated funds for child development, which cover Child Development Centers (CDCs), Family Child Care (FCC), and Supplemental Programs and Services. In terms of child care, Table 2.12 shows that Fort Carson and Fort Lewis appropriated nearly 50 percent more per soldier than other divisional posts, while Fort Bragg and Fort Hood appropriated comparatively little. Further, Forts McCoy and McPherson

Table 2.12
Selected Personnel and Community Affairs
FY94 Appropriated Expenditure per Soldier

Installation	Library Expenditure	Child Development Expenditure
Bragg	15	38
Campbell	21	70
Carson	22	149
Drum	25	66
Hood	11	43
Lewis	44	127
Riley	16	80
Stewart	23	87
Irwin	17	193
McCoy	27	304
McPherson	152	284
Polk	29	104
Sam Houston	28	116
Total	23	80

SOURCE: Defense Manpower Data Center.

roughly double Carson's child development appropriation per soldier. What is the source of this relatively large variation in what should be a reasonably standardized program?

The heterogeneity of child development expenditure per soldier emanates from, at least in part, differences in the availability of CDC care at the installations. Table 2.13 compares the number of care slots at the CDCs at each installation. CDC care is the preferred form of child care for military parents, but it is also by far the most regulated and expensive (see Zellman and Johansen, 1995). Table 2.13 shows that CDC care is proportionally most available at Fort McPherson and least available at Forts Hood and Bragg. McPherson's CDC availability exceeds Bragg's by more than a factor of 3.5.

Command preference drives the availability of child care spaces. FORSCOM headquarters indicated to us that installation commanders and their staffs determine the level and type of services needed to support that community's child care requirements. Factors that commanders might consider include the number of married soldiers at the installation, the number of DoD civilians, projected changes in installation mission or size, the number of family housing units available for use as FCC homes, and the availability and cost of child care options off the installations.

Table 2.13
Installation Child Development Center Availability

Installation	Military Population	CDC Spaces	Soldiers Per CDC Space
Bragg	44,503	756	58.87
Campbell	22,658	578	39.20
Carson	13,930	514	27.10
Drum	14,887	386	38.57
Hood	44,421	874	50.82
Lewis	21,568	872	24.73
Riley	13,135	298	44.08
Stewart	19,149	560	34.19
Irwin	4,792	198	24.20
McCoy	1,017	54	18.83
McPherson	2,913	179	16.27
Polk	9,206	356	25.86
Sam Houston	7,827	297	26.35
Total	220,006	5,922	37.15

SOURCE: Jan Hicks, Forces Command.

Child care is supported not only by appropriated funds, but also by NAF fees from parents and additional subsidies from other NAF resources on the installations. One can separate the total child development funding into its component parts, including child development center appropriations. We obtained additional data from FORSCOM on child development center parental fee income and the nonappropriated fund subsidies from other NAF operations, e.g., bowling alleys and golf courses. Table 2.14 shows the total CDC expenditures in FY94.

Even with parental fees and appropriated funds, all the installations operate their child development centers at a loss, choosing to make additional NAF contributions. The extent of these NAF contributions varies considerably. Combining appropriations, parental fees, and other NAF contributions, total expenditures per child development center slot range from \$3,231 at Fort Bragg to \$7,373 at Fort McCoy, with a mean of \$4,350. There is no obvious explanation for this large variation.

Logistics Functions

Within the Directorate of Logistics we examined the costs of operating the Troop Issue Support Activities (TISA). TISAs are food storage warehouses; units draw food from TISAs when going into the field, for instance. Table 2.15 presents the expenditures for this

Table 2.14
Installation Child Development Center Total Expenditure

Installation	CDC Appropriated Expenditure (millions)	CDC Parental Fee Income (millions)	CDC NAF Subsidy (millions)	CDC Total Expenditure (millions)	CDC Spaces	Total CDC Expenditure Per CDC Space
Bragg	1.05	1.03	0.37	2.44	756	3,231
Campbell	0.93	1.02	0.19	2.14	578	3,709
Carson	1.17	1.19	0.06	2.42	514	4,709
Drum	0.52	0.70	0.30	1.52	386	3,939
Hood	1.26	1.57	0.98	3.80	874	4,349
Lewis	1.79	2.33	0.35	4.47	872	5,128
Riley	0.71	0.56	0.12	1.39	298	4,664
Stewart	1.28	1.06	0.24	2.58	560	4,611
Irwin	0.43	0.41	0.04	0.89	198	4,482
McCoy	0.24	0.13	0.04	0.40	54	7,373
McPherson	0.33	0.44	0.13	0.90	179	5,054
Polk	0.56	0.53	0.12	1.20	356	3,378
Sam Houston	0.70	0.73	0.17	1.60	297	5,379
Total	10.97	11.69	3.10	25.76	5,922	4,350

SOURCES: Defense Manpower Data Center and Jan Hicks, Forces Command.

function, which include the labor costs of operating the TISA but not food costs. With some exceptions, one would expect the cost per soldier or total expenditures to be reasonably consistent across installations.

In fact, these expenditures are not consistent. There is large variation across installations for what is essentially a warehouse operation. Fort Drum, for example, spent nearly five times as much per soldier on its TISA as did Fort Hood. Indeed, Fort Drum's absolute level of TISA expenditure was nearly 1.6 times Fort Hood's. We expect that this result derives, at least in part, from the FY94 deployment of forces from Fort Drum. Unfortunately, however, the accounting data do not make it possible to investigate this hypothesis further.

Table 2.15 also shows that nondivisional posts like McPherson and Sam Houston have aggregate TISA expenses that equal or exceed aggregate TISA expenditures at divisional posts like Campbell, Riley, and Stewart. Per soldier TISA expenses are particularly notable at McCoy, McPherson, and Irwin. These expenditures may be driven by primarily training missions and the presence of transient soldiers, as discussed earlier, for Forts McCoy, Irwin, and Polk, but other explanations are needed for McPherson and Sam Houston.

Table 2.15
FY94 TISA Expenditures

Installation	TISA Expenditure (millions)	Military Population	TISA Expenditure per Soldier
Bragg	1.34	44,503	30
Campbell	0.48	22,658	21
Carson	0.55	13,930	39
Drum	0.99	14,887	67
Hood	0.63	44,421	14
Lewis	0.86	21,568	40
Riley	0.49	13,135	37
Stewart	0.45	19,149	23
Irwin	0.68	4,792	142
McCoy	0.24	1,017	241
McPherson	0.54	2,913	184
Polk	0.52	9,206	57
Sam Houston	0.41	7,827	53
Total	8.18	220,006	37

SOURCE: Defense Manpower Data Center.

To reduce these costs in the future, many installations are now investigating the use of contracted direct delivery of rations to mess halls. Once that approach becomes more common, TISAs may be an area in which it will not be too difficult to evaluate the relative costs of contracted versus government civilian operation. Moreover, it should be possible for FORSCOM and the Army to examine TISA operations at different installations to learn how to make them more efficient and less costly.

CONCLUSIONS

As the analysis above has indicated, we must conclude that we cannot develop a model of installation base operating costs based on gross installation characteristics. The costs of most functions vary too much across installations with little or no indication of why these variations exist. Where some of the influences can be identified, they do not seem to be consistent across functions or to be easily amenable to analysis. To develop a model with any predictive capability, we would have to perform a detailed study of base operating costs at a number of installations over a period of several fiscal years. In that period, however, the number of internal and external changes taking place would further complicate the process. At best, it may be possible to analyze the costs of individual functions, given thorough study and improved accounting practices.

Other Problems in Cost Model Development and Analysis

To complicate further the development of a cost model, a number of other problems also interfere with the process. The deployment of forces from Fort Drum during FY94 has increased base operating costs there and complicated the analysis. Accordingly, we looked at the base operating costs there over the last three years to see how the costs of various functions might change during deployments. We found virtually no functions whose costs decreased, but a number that showed significant increases. One conclusion that we might draw from these results is that it is difficult to reduce the operating costs at installations in the short run.

Table 2.15 and other expenditure patterns suggest there are real differences in the operating costs of some functions. Such a finding would argue that some installations are more efficient at certain functions than others. FORSCOM should consider determining why these installations are cheaper (more efficient?) and perhaps use them as Centers of Excellence or benchmarks for the other installations.

At the same time, we are concerned that some of our observations about expenditure patterns may be inaccurate due to problems with the accounting system data. For example, Table 2.16 shows educational counseling expenditure per soldier, taken from the AMSCO for that function. Remarkably, these data indicate that Forts Hood and Lewis spent no money during FY94 for counselors. We know from our installation visit that Fort Hood does have counselors, thus it seems more likely that Hood and Lewis have placed these expenditures in some other category (AMSCO).

Our conclusion from this and other evidence must be that the data in the Army accounting system are more unreliable than we had hoped or expected. The results in Table 2.16 suggest there may be accounting irregularities in this information. Not only does this seriously complicate the modeling process, but it should also make one very cautious about overinterpreting any results based solely on data from the accounting system.

Other findings herein may be driven by unusual circumstances or different funding oddities. Fort Drum's substitution of annual expenditures for one-time MCA capital expenditures in public works and housing provides a clear example. Moreover, the data we have examined represent one-year funding totals. In some categories the totals may change considerably from year to year, because of delays in programs, availability of year-end resources, irregular availability of personnel and facilities, or even commander preferences. Also, as in the case of Fort Drum, major deployments overseas may dramatically affect expenditures. Finally, Fort McPherson's totals may include some FORSCOM-wide expenses that are not separately identified in the data.

Table 2.16
FY94 Educational Counseling Expenditures

Installation	Educational Counseling Expenditure (millions)	Educational Counseling Expenditure per Soldier
Bragg	0.72	16
Campbell	0.22	10
Carson	0.58	42
Drum	0.29	20
Hood	0	0
Lewis	0	0
Riley	0.67	51
Stewart	0.57	30
Irwin	0.07	16
McCoy	0	0
McPherson	0	0
Polk	0.30	32
Sam Houston	0.22	28
Total	3.63	17

SOURCE: Defense Manpower Data Center.

In the long run, one cannot be certain that these tallied expenditures are complete. For instance, government employees will be more expensive than tabulated if the full costs of their pensions and other benefits are not considered. Also, the costs of military manpower working in base support positions are not taken into account in the figures, as military pay and allowances are funded separately and are not part of installation operating budgets. To the extent that military personnel are substituted for civilian positions within the garrisons of the various installations, these differences in cost cannot easily be identified or modeled.

When considering this information, we must further be aware that evidence showing one installation to be more costly than another may simply reflect a higher quality of life or other advantages at the installation. Clearly it is not necessarily a bad thing to spend more money if it results in higher morale, readiness, and/or re-enlistment. The Army must consider such variations in effectiveness or quality of life when comparing the costs of installations and deriving efficiency measures or benchmarks in the future.

These caveats notwithstanding, this analysis suggests there is considerable heterogeneity in the spending at FORSCOM installations and in the quantity and quality of services provided to soldiers. If function of the major commands is to standardize the soldier quality of life across installations, it appears that this is being performed incompletely.

Moreover, because the costs of the services provided by installations vary so much, and without obvious cause, there may be good reason to believe that further investigation will turn up efficiencies and inefficiencies in the system and opportunities for significant cost reductions.

To this end, FORSCOM might wish to consider comparing installations using categorized data of the type we have discussed. High expenditures in a category may be merited, but perhaps supplemental funding should not be provided if an installation's expenses are extraordinary. We do not approve of strict standards across installations, but extraordinary expenditures should not be rewarded.

Before this can be done, however, the Army will have to develop or obtain a cost accounting system. Without cost accounting, even the installations have difficulty determining how much each function costs to perform. Activity Based Costing (ABC), which is currently being implemented at some installations, may help with this process, but a real cost accounting system would be preferable in the long run.

3. REENGINEERING APPROACHES VARY IN SUCCESS

This section describes ongoing cost-reduction efforts in FORSCOM. We focus, in particular, on installation reengineering activities and on the various initiatives being investigated in the XVIII Airborne Corps and III Corps under the FORSCOM Installation XXI program. We will also discuss centralization proposals in more general terms, considering some of the issues that these proposals raise and the possibilities for long-term benefits. We conclude this section by discussing the possibility for greater competition and reimbursability across installations.

DECENTRALIZED REENGINEERING

Under the Installation XXI initiative, each corps installation was given the task of investigating an alternative approach to reducing the costs of base operations. The XVIII Airborne Corps, including Forts Campbell, Drum, and Stewart, with its headquarters at Fort Bragg, was tasked to examine greater coordination and partnerships with local government, state, and private organizations. Such coordination might take the form of operating on-post libraries in conjunction with the local community, or providing land for highway construction projects that also improve installation access and transportation. While investigating these opportunities, the installations also pursued a decentralized reengineering approach that examined consolidation, process modifications, and activity streamlining. Their goal was, of course, to reduce personnel, inventory, and facilities over the short and long term.

From our visits and interviews, we concluded that the XVIII Airborne Corps installations appeared to be coordinating their efforts with a relatively minimal amount of acrimony and tension. During our meetings with garrison personnel, we found that they seemed to be communicating and cooperating well in the effort, using regular meetings, videoteleconferences, and other methods of exchanging ideas and information. Moreover, there are some encouraging early indications. For example, Fort Bragg is in the process of warehouse consolidation within the DOL and DPW that it believes will result in significantly fewer warehouses for the installation to maintain and staff.

The XVIII Corps reengineering effort has been focused at the installation level. This decentralization has been a key feature in the development of the program. For example, though information is disseminated across installations, Fort Stewart personnel are fundamentally responsible for improving processes and finding efficiencies at Fort Stewart. The corps headquarters and the major command can assist installations, but, in light of

installation heterogeneity, we believe reengineering must fundamentally occur at the installation level.

The ultimate savings from XVIII Airborne Corps reengineering remain unclear, however, and may be difficult to realize. For example, in the case of Fort Bragg's warehouses, we do not know what will ultimately happen to any identified surplus warehouses. If such warehouses are torn down or leased to the private sector, it is reasonable to believe the government will save money.³ If, however, the warehouses are ultimately absorbed by other units, directorates, or government agencies, no net savings to the government are likely. Unused facilities on Army installations have a worrisome tendency to be occupied by other military or Army users. These new users may be important and valued, but few if any savings are likely to come from building usage switches. Similar or related arguments can be made for potential reductions in personnel and lines of inventory. Under these conditions, FORSCOM or the Army need to follow up on reengineering plans and proposals to ensure that the maximum savings have been realized over the long run.

INSTALLATION CENTRALIZATION

As their part of the Installation XXI initiatives, Fort Hood investigated the concept of having Fort Hood act as a "megainstallation" for the corps, with responsibility for itself, Fort Carson, Fort Irwin, and Fort Riley. Although Fort Hood was given the task of examining the potential costs and benefits of this arrangement, it was never given specific guidance about how the concept would be implemented in practice. For instance, the remaining role of a commander at a satellite installation was unclear because of the potential separation of command and control.

Centralization Issues

We also found a number of potential concerns about greater centralization of authority. The proposal caused significant confusion and high levels of animosity, not only at the potential satellite installations, but also at Fort Hood. In addition, there was concern that this type of organization would only add a management level between the satellite installations and FORSCOM or Department of the Army (DA). Every additional level of management has the potential to increase delays and cause other bureaucratic problems.

³The savings would probably be smaller if the warehouses are only leased to private parties rather than torn down. If the warehouses are leased, the installation would probably provide maintenance and utilities on a reimbursable basis. As noted in Halliday et al. (forthcoming), the reimbursement rates are generally not sufficient to cover the true costs.

Finally, the initial analyses performed at Fort Hood indicated that the potential savings from implementing this concept might be small and easily offset by unforeseen costs. For example, implementing the necessary communications to operate a hub/satellite system within III Corps would cost at least \$18.5 million initially, with a recurring annual cost of about \$2 million. There would also undoubtedly be increases in transportation and travel costs.

Certain issues need to be considered in all centralization decisions. We emphasized the heterogeneity of installations in Section 2. The major differences between a parent installation and its subinstallations would complicate effective resourcing and management of the subinstallations. The challenge would be increased by the geographic separation and differences in the laws and regulatory climate in the different states. For example, our research last year on subinstallations unearthed a number of troubled relationships, e.g., the problems between Fort McPherson and Fort Buchanan. Though the two installations have very different missions, Fort McPherson is Fort Buchanan's "parent" installation. We were told they have had recurring disagreements over policy, resources, and procedures, some of which seem to be exacerbated by the geographic separation and corresponding lack of understanding of the problems facing the other installation.

We have heard that there have been a variety of problems in Germany and Korea with the "area support group" concept in which operations for a number of small installations are centralized. The "subinstallations" under this approach felt they were neglected by the parent installations. We were also told that centralized installation management was abandoned in Korea. A number of installation functions, e.g., Morale, Welfare, and Recreation (MWR), Logistics, and Engineering, were controlled from Seoul for all U.S. Army bases in Korea. There were numerous problems with this structure, which was ultimately abandoned in 1991.

Past research by Massey (1983) did not find many advantages to a "megainstallation"-like approach in the San Antonio area. He examined SARPMA, the San Antonio Real Property Maintenance Area, which was created in 1978 to coordinate property maintenance among four Air Force bases and one Army base in the San Antonio area. Massey did not find any evidence that SARPMA saved money, and presented arguments that it was less sensitive to base requirements than autonomous provision had been. SARPMA was eventually disbanded. Note, too, that SARPMA did not involve installations in different states nor installations separated by considerable distance.

Environmental services seem particularly challenging for a megainstallation approach. Under current law, installation commanders are personally liable for

environmental infractions that occur on their watch. Furthermore, different states have different environmental laws, procedures, and personnel with whom the installations must deal. Rubenson et al. (1994) touch on this issue. They argue that the current major command (MACOM) structure is quite poorly designed to handle environmental issues. They propose that regional environmental offices be set up to provide environmental policy headquarters functions for all DoD installations in the area. Their proposal is quite different from the megainstallation proposal, though, in that they envision regional offices covering the installations of all services and replacing, rather than supplementing, MACOM- and Army-level environmental personnel.

Given the level of resistance we encountered at all III Corps installations, the lack of experience with hub/satellite organization, and the uncertainty about how the proposal would be implemented, we are not surprised that the Fort Hood study predicted only small cost savings from centralization.

This is not to say, however, that some functional centralization is not possible and might not be cost-effective. Perhaps functions that do not require direct physical presence on an installation could be centralized, such as some parts of Contracting, Judge Adjutant General, and the Civilian Personnel Office (CPO). At the Kelly Support Facility, for example, the garrison staff reported that Fort Drum was able to assist them with contracting complications over the telephone and with only occasional visits.

As an alternative to direct centralization, instituting competition among installations may indirectly lead to some functional centralization and reduced operating costs.

Greater Competition and Reimbursability?

An indirect approach to centralization may be more appropriate or effective in the long run. If installation customers had the option of shopping for their Civilian Personnel Office support, for instance, one might see business concentrated at CPOs that were perceived to be doing well. Similarly, although some were quite satisfied, a number of personnel we talked to were unhappy with the performance of their installation contracting offices. One directorate told us that in one case they requested a cost plus award fee contract from the installation contracting office but instead received a firm fixed price contract that did not work well. This directorate would probably welcome the opportunity to use alternative contracting support. Making more installation functions reimbursable would likely result in some function centralization and improved efficiency, without requiring direct outside intervention.

The megainstallation concept also included the possibility of establishing Centers of Excellence (COEs) at the III Corps installations. This approach is designed to concentrate repairs and other activities at installations that perform them most effectively or efficiently. In theory this approach could work well, if all of the relevant costs were properly considered in the initial decision and selection process. In Section 5, however, we discuss some concerns we have with the setting of reimbursement rates for such work and also how civilian pay caps may lessen the gains from the COE approach.

Reserve Component support has already moved toward more reimbursability. Many reserve units are now funded directly and allowed to choose where to purchase support they need. Active Component units could also be directly funded and allowed to purchase services they wish from whomever they desire. As we discuss in Section 5, however, FORSCOM's potential reimbursable pay cap could discourage FORSCOM installations from taking on business from others while reducing the choices available to reserve units. The advantages of competition are reduced when there are fewer competitors.

The Defense Finance and Accounting Service (DFAS) is consolidating regionally. Currently its plan is for installations to interact with a specified DFAS office; for example, Fort Riley will deal with the Lawton, Oklahoma, DFAS office for certain functions. It might improve DFAS efficiency to allow installations to obtain DFAS support from whichever DFAS office they prefer. As a future alternative, installations might be allowed to contract with private-sector accounting service firms too, if they so desire.

Reimbursability is not a cure-all, however. For example, garrison personnel at one installation we visited told us they were unhappy with the service they received from the local Army Corps of Engineers district. However, they indicated that the "old boys network" discouraged their military director from hiring another Corps of Engineers district instead. Clearly, the benefits of a reimbursement-based system are eviscerated if, in practice, installations cannot freely choose among competing providers.

4. CONTRACTING PROVIDES BENEFITS, BUT IS NOT A PANACEA

Contracting out or outsourcing has recently become a popular approach for reducing the military's costs. See, for example, the Commission on Roles and Missions of the Armed Forces (1995). In this section, we consider the general area of contracting out base operations functions at FORSCOM installations. We will discuss the advantages and disadvantages of contracts, the A-76 Commercial Activities competition procedure, and the potential costs and savings of contracts. In particular, we will focus on contracting at the Fort Carson DPW and the Fort Riley DOL and discuss the applicability of these contracts to other installations.

Contracting of functions in base operations is widespread, though the extent of contracting varies across installations. The benefits of contracting appear to be more in the realm of better service rather than short-run cost savings. Contracting could be expanded, but the current process is lengthy and cumbersome. A streamlining of the contracting process could be beneficial.

Contracting is already important at every FORSCOM installation. As shown in Table 4.1, more than 50 percent of all base operating costs were contracted in FY94. Fort Irwin does the most contracting proportionally; Fort Stewart the least. These contracting totals are not restricted to service contracting. If, for example, supplies or equipment were purchased from private-sector vendors, such expenditures would also be counted as contracted.

Though all DPWs use some contracting, Fort Carson, along with Fort Irwin, is noteworthy for having a large base operations (BASOPS) contract. Table 4.2, which presents the expenditures for public works in FY94, shows that Fort Carson had the largest percentage of its public works category spending going to contractors among the divisional posts.

In the same way, Table 4.3 shows total and contracted logistics expenditures. Although the table shows that Forts Bragg, Hood, and Irwin had a higher percentage of their total logistics spending going to contractors in FY94, the Fort Riley DOL stands out because it uses contracted labor for all of its maintenance activities and ammunition supply point operations. We will discuss this contract in more detail later.

Table 4.1
FY94 Installation Contracting

Installation	Total Direct Expenditure (millions)	Total Direct Contracted Expenditure (millions)	Installation Contracting Percentage
Bragg	192.0	112.3	58.5
Campbell	95.6	55.7	58.3
Carson	91.8	56.5	61.6
Drum	144.1	84.8	58.8
Hood	170.4	96.5	56.6
Lewis	150.6	80.1	53.2
Riley	92.1	52.2	56.7
Stewart	90.9	39.3	43.2
Irwin	77.2	61.4	79.5
McCoy	75.7	36.1	47.7
McPherson	108.5	58.6	54.0
Polk	86.8	43.4	50.1
Sam Houston	90.8	48.4	53.3
Total	1,466.5	825.5	56.3

SOURCE: Defense Manpower Data Center.

Table 4.2
FY94 Contracted Public Works Expenditures

Installation	Total Expenditures (millions)	Contractor Expenditures (millions)	Contracted Percentage
Bragg	64.6	38.9	59.9
Campbell	34.8	18.7	53.7
Carson	36.9	30.7	83.1
Drum	52.1	29.3	56.3
Hood	52.7	31.3	59.4
Lewis	54.8	27.9	51.0
Riley	30.7	17.7	57.8
Stewart	32.0	12.1	37.8
Irwin	25.2	23.8	94.6
McCoy	28.2	15.6	55.4
McPherson	35.7	21.6	60.5
Polk	24.4	10.6	43.7
Sam Houston	28.2	11.7	41.5
Total	500.2	289.8	57.9

SOURCE: Defense Manpower Data Center.

Table 4.3
FY94 Contracted Logistics Expenditures

Installation	Total Expenditures (millions)	Contractor Expenditures (millions)	Contracted Percentage
Bragg	42.0	23.2	55.3
Campbell	13.4	6.6	49.4
Carson	14.7	6.0	40.5
Drum	25.0	9.5	37.8
Hood	34.2	20.0	58.4
Lewis	29.2	13.2	45.2
Riley	17.8	9.5	53.7
Stewart	21.0	9.6	45.8
Irwin	16.0	12.4	77.6
McCoy	26.0	10.0	38.3
McPherson	20.2	5.6	27.8
Polk	16.0	7.4	46.1
Sam Houston	16.9	7.4	43.9
Total	292.6	140.4	48.0

SOURCE: Defense Manpower Data Center.

THE FORT CARSON BASOPS CONTRACT

Fort Carson has had a large base operations (BASOPS) contract since FY88. This contract came about through an A-76 Commercial Activities competition. A-76 is the Office of Management and Budget (OMB) Circular discussing this process. The contract is cost plus award fee with a base year plus four option years. The FY95 cost was about \$9.1 million.⁴ Pacific Architects and Engineers (PAE) is the current contractor, now in the first option year of their contract. PAE was awarded the BASOPS contract in a competitive bidding after the expiration of the first five-year contract with General Electric.

The contractor has a basic set of operations and maintenance responsibilities, as shown in Table 4.4. The contractor receives and prioritizes repair orders and must respond in a timely fashion. The contractor also provides necessary services and submits requisitions based on its costs for the services rendered. These basic responsibilities have resulted in the BASOPS contractor receiving between \$9 million and \$14 million per year.

⁴The Fort Carson DPW also has smaller contracts for hospital maintenance (\$1.6M in FY95) and housing maintenance (\$1.3M in FY95).

Table 4.4
Fort Carson Base Operations Support Contract

Functional Areas of BASOPS Contract
Army installed equipment and systems maintenance
Maintenance and service equipment maintenance
Natural gas distribution and regulation system
Industrial wastewater treatment plant
Central heating plants and systems
Exterior electrical distribution systems
Performance of project work
Performance of repair work
Landfill operations
Grounds maintenance
Railroad maintenance
Central cooling plant
Asbestos remediation
Snow removal and ice control
Maintenance of surfaced areas
Sewage treatment plant
Water systems

SOURCE: Fort Carson Directorate of Public Works.

The BASOPS contract can also accommodate special projects, which are specified and funded separately; this facilitates using end-of-the-year money. The amount devoted to special projects has varied widely from less than \$1.2 million in FY93 to almost \$11 million in FY91.

The Carson BASOPS contractor is evaluated periodically on its performance of work, cost control, and management. These evaluations determine the award fee received. The Carson DPW has four inspectors who check the contractor's work. We were told the contractors have historically received from 85 to 90 percent of the possible award fee.

The DPW and garrison personnel we met at Fort Carson were quite pleased with this arrangement. They felt the BASOPS contractors have been responsive and effective in their work. They avoid union problems and the difficulties of dealing with the government personnel system. They view their BASOPS contract as a model that can be emulated by other installations. In their view, the primary advantage of their BASOPS contract is better service and greater flexibility, not lower costs.

There is no definitive quantitative evidence either supporting or opposing this arrangement. The ability to perform appropriate "preventive maintenance" defies easy

quantification. Furthermore, Carson's mission has changed over time, and its current mission and situation differ on a number of dimensions from those of other installations.

Using the DMDC expenditure data discussed in Section 2, we find some moderate evidence that Carson's public works category spending is somewhat high. Table 4.5, for example, shows that public works functions represent a higher fraction of installation expenditures at Carson in FY94 than at any of the other installations. Public works spending per building square foot was also higher than at any other divisional post, and public works spending per soldier was higher than at all the divisional posts but Fort Drum. On the other hand, Carson's public works spending per acre was the lowest among FORSCOM's divisional posts. Of course, much of Carson's acreage falls in Piñon Canyon, which may require comparatively little public works support.

Any data comparisons of this sort are burdened with the accounting system uncertainty and other problems discussed earlier. In particular, they may misrepresent the true cost to the extent that the long-term costs of government employees are misestimated and the costs of military personnel are not included.

Table 4.5
FY94 Public Works Expenditures

Installation	Expenditures (millions)	Expenditure as Percent of Total Expenditure	Expenditure per Building Square Foot	Expenditure per Soldier	Expenditure per Acre
Bragg	64.6	33.7	2.20	1,452	345
Campbell	34.8	36.4	1.99	1,535	331
Carson	36.9	40.2	4.28	2,651	97
Drum	52.1	36.1	3.23	3,497	412
Hood	52.7	30.9	3.11	1,186	242
Lewis	54.8	36.4	2.14	2,539	106
Riley	30.7	33.3	3.63	2,339	305
Stewart	32.0	35.2	2.40	1,673	110
Irwin	25.2	32.6	7.40	5,253	39
McCoy	28.2	37.2	5.02	27,695	471
McPherson	35.7	25.4	3.50	12,242	13,468
Polk	24.4	28.1	1.45	2,648	123
Sam Houston	28.2	25.7	2.53	3,609	910
Total	500.2	34.1	2.73	2,274	175

SOURCE: Defense Manpower Data Center.

Although it may not save money, the Carson BASOPS contract may insulate its public works expenditures from budget cuts. This effect could explain the disproportionate share of Carson spending in the public works arena. Alternatively, this may simply reflect commander preferences or inherent characteristics of the installation. Finally, the higher operating costs may also represent better maintenance and preventive maintenance, both of which will reduce investment and replacement costs in the long run. This effect could be proved, however, only by a long-term study of multiple installations. In conclusion, we could find no definitive evidence that contracting of this type saves money, either in the short or long run, but such evidence may be available to a longer, more intensive investigation.

CONTRACTING IN THE FORT RILEY DOL

The Fort Riley Directorate of Logistics currently has ten separate contracts, as shown in Table 4.6. The maintenance contract was the first of this set. It was developed through a two-year A-76 process in the early 1980s.

The original maintenance contract, with Lear-Ziegler, was written as firm fixed price. The Fort Riley DOL found this relationship to be difficult. Garrison personnel alleged that Lear-Ziegler underbid on the contract to "buy in" and then complained about the workload it received. After the expiration of that four-year contract, the new maintenance contract was negotiated as a cost plus award fee arrangement. This contract, with CSI as the maintenance contractor, has been far more successful.

Table 4.6
Fort Riley DOL Contracts

Function	Contractor	FY95 Direct (\$ thousands)	FY95 Reimb (\$ thousands)
Maintenance	CSI	6,195.6	262.6
Oil lab	Terminal Services	156.0	0
Ammunition supply point	Transtecs Corp	457.9	0
Central issue facility	Deleon Tech Services	266.6	0
Food service	Palmer Intl Foods Inc.	2,322.2	22.0
Laundry/dry cleaning	Penn Enterprises	241.1	71.4
Retail gas	Radius	33.2	0
Tmp/mil taxi	Radius	441.9	68.1
Intra post bus	Radius	79.4	0
School bus	Radius	110.9	0

SOURCE: Fort Riley Directorate of Logistics.

Subsequent contracts were somewhat easier for Fort Riley. The Riley ammunition supply point (ASP) contract was based on ASP contracts from other installations, albeit with modifications specific to Fort Riley. With the exception of the maintenance contract, all the contracts are firm fixed price. In each case the installation provides the facilities and all capital equipment. Spare parts and stocks are ordered through the government supply system. The contractors provide only labor and hand tools.

The personnel at the Riley DOL felt that their contractors were more efficient in the long run than government employees. For example, given government civilian personnel rules, contractors are able to expand and reduce operations much more rapidly and easily than the government can. Contractors do not face bumping and seniority rules, and are not subject to the civilian pay cap.

In the view of the Riley DOL, these contracts are not necessarily cheaper than using government employees, but the service is better and more flexible. Note, however, that the contractors had to be cheaper at one time in order to win the A-76 competition. The DOL staff think that they should probably consolidate some of these contracts in the future to simplify contract management and perhaps reduce costs. As it stands, the four Radius contracts all have the same point of contact. However, larger, consolidated contracts may carry higher risks if relations with the contractor sour.

Our analysis of the DMDC expenditure data found nothing remarkable about logistics spending at Fort Riley. As shown in Table 4.7, Fort Riley's logistics expenditure per soldier was second highest among the divisional installations, but this may simply be a result of Riley's comparatively small population and economies of scale. Riley did not spend an unusual fraction of its resources on logistics. Of course, Table 4.3 suggested that Fort Riley's overall DOL contracting fraction is not extraordinary. As a result, it is difficult to conclude whether or not these contracts save money in the short run. They may be more cost-effective in the long run, however, if only because they have more flexibility and can be scaled up and down more quickly and easily than a civilian work force.

Our conclusion must be that, as with Fort Carson's public works contract, there is no definitive evidence that Riley's DOL contracting saves money for the Army. This is a sense that contracted operations provide better service, and in doing so may save money in the long run.

Table 4.7
FY94 Logistics Expenditures

Installation	Expenditures (millions)	Expenditure as Percent of Total Expenditure	Expenditure per Soldier
Bragg	42.0	21.9	943
Campbell	13.4	14.1	593
Carson	14.7	16.0	1,057
Drum	25.0	17.4	1,682
Hood	34.2	20.1	770
Lewis	29.2	19.4	1,353
Riley	17.8	19.3	1,355
Stewart	21.0	23.1	1,096
Irwin	16.0	20.7	3,342
McCoy	26.0	34.3	25,558
McPherson	20.2	14.4	6,951
Polk	16.0	18.5	1,743
Sam Houston	16.9	15.4	2,157
Total	292.6	19.9	1,330

SOURCE: Defense Manpower Data Center.

CONTRACTING ELSEWHERE?

Garrison employees frequently argue that contracting along the lines of Fort Carson's BASOPS contract or Fort Riley's Directorate of Logistics contracts would not be suitable for their situations. Although we are skeptical, it is difficult to evaluate completely the veracity of their claims. U.S. General Accounting Office (1985) reports on its study of a sample of 20 DoD functions that were converted to contractor performance through the A-76 process between October 1, 1978, and February 28, 1981. Although this analysis is old, the GAO found that cost savings were realized in 17 of the 20 cases. More recently, U.S. General Accounting Office (1991) argued that a logistics contract at Fort Sill has not realized expected cost savings and has had administrative problems. For example, Fort Sill apparently paid award fees for less than minimum standard performance.

In any case, several practical concerns impede increased contracting along the lines of Carson's BASOPS and Riley's DOL contracts. The A-76 competition process can be extremely time consuming and labor intensive. It requires a minimum of 18 months to conduct an A-76 competition if more than ten government jobs are affected and a minimum of two years if more than forty-five government jobs are involved. We were told the process of conducting the competition and developing the Fort Carson public works contract required

six or seven years. The Fort Riley DOL had its maintenance contract in place in about two years. However, the Fort Riley Directorate of Public Works spent six years trying to develop a BASOPS contract similar to Fort Carson's before it ultimately abandoned the process in the late 1980s. Figure 4.1 depicts the Fort Carson and Fort Riley contracting time line.

The A-76 process has a number of requirements that make it difficult to conduct. In part this difficulty arises from the requirement for a detailed specification of the work to be performed. It can be extremely time consuming to develop this work statement. We discovered situations in which the initial contracts developed at installations proved to be inadequate and resulted in financial and performance problems. These contracts had to be renegotiated with revised work statements, generally at higher cost.

Given the comparatively short time horizons of garrison commanders and the potential turmoil involved in the process, there appears to be no significant interest today in more A-76 competitions. These competitions are no longer required of installations, but may be forced upon them indirectly by the civilian pay cap and other personnel restrictions. Unfortunately, because the competitions can be very expensive to conduct, the current reductions in operating budgets further impede the initiation of major actions.

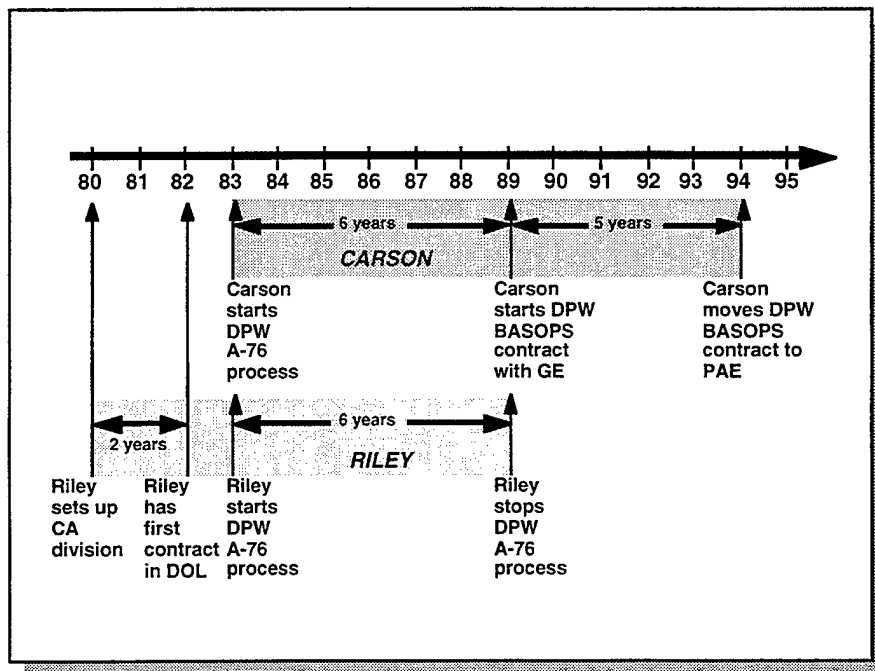


Figure 4.1—Fort Carson and Fort Riley Contracting Time Line

5. CURRENT ISSUES IN INSTALLATION MANAGEMENT

From the installation's perspective, many actions taken by higher headquarters, either in Atlanta or Washington, D.C., do not produce the desired results. In this section we discuss some problems with policies being implemented by higher levels in the Army. First, we note how installations can be caught between dueling higher-level offices ("stovepipes"). Second, we discuss how pay caps may give rise to greater contracting, irrespective of costs. Third, we describe how the Centers of Excellence program under the Integrated Sustainment Maintenance concept may not only be frustrated by current policies, but also could result in duplicative repair capacity and lower repair quality. Finally, we note how interinstallation competition may result in underpricing of services and repairs.

The policies of the Department of the Army (DA) and FORSCOM may not be producing the expected results at the installation level because of misaligned incentives at the lower levels of the Army. System participants tend to respond rationally and intelligently to the incentives they are provided. It is counterproductive if these individuals (or units) are intentionally or unintentionally given incentives to behave in ways counter to the interest of the Army as a whole.

DUELING STOVEPIPES

Installations sometimes see themselves trapped between the mandates of apparently dueling headquarters. For example, the Fort Riley Directorate of Community Activities (DCA) noted that the Department of the Army Community and Family Support Center (CFSC) was trying to force it to upgrade the general support (GS) levels of some of its Child Development Center (CDC) employees. Simultaneously, there are stringent regulations mandating the number of CDC children per employee. In opposition to these policies, the FORSCOM civilian pay cap for FY96 required an overall reduction in civilian pay at the installation. The result of this type of policy conflict must be either fewer children in the CDC system or reductions in other functions within the Fort Riley DCA.

Several installations have had problems with policies concerning their High Frequency Military Affiliate Radio System (HF/MARS) radio stations. Although the stations are largely obsolete, until recently the office of the Army Deputy Chief of Staff for Operations (DCSOPS) would not allow installations to eliminate them or stop staffing them for emergency operations, even though FORSCOM would not give the installations resources to operate them. DCSOPS recently changed its policy, but in the interim, for example, Fort Bragg was

forced to construct a new \$600,000 building for its HF/MARS station. Such costly and unnecessary conflicts should not occur with proper coordination of policy at higher levels, e.g., between DCSOPS and FORSCOM.

As a third example, the Army Continuing Education System (ACES) stovepipe, with its roots in federal law, requires the use of government civilian counselors in the program. This effectively prohibits installations from reducing civilian personnel or their costs through use of contracted counseling services. To reduce program costs they can only reduce the number of counselors.

THE CIVILIAN PAY CAP INCENTIVE PROBLEMS

Congress and the executive branch have recently exerted pressure to reduce the number of government employees. This pressure has been translated by the Department of the Army and FORSCOM into installation-level government employee pay caps for nonreimbursable work. Pay caps constrain the total amount paid to government employees at an installation. Manpower ceilings, which constrain the total number of government employees at an installation, are often used in conjunction with, or as an alternative to, pay caps.

Pay caps and manpower ceilings have a number of undesirable features. By including both overtime and temporary workers, they place an absolute limit on the civilian work force. In the absence of significant efficiency improvements or elimination of services, this limit may force the installations to contract out new work and functions, even if contracting may not be cost-effective.

Integrated Sustainment Maintenance

Under the Integrated Sustainment Maintenance (ISM) program the Army would use regional Centers of Excellence (COEs) to perform general support (GS) level maintenance of reparable exchange (RX) items. By the procedures established for the ISM program, installations bid for these COEs, which are awarded primarily on the basis of cost, demonstrated capability, capacity, and repair time. The process also requires that COEs be rebid when installations either fail to perform adequately or choose not to continue.

The civilian pay cap could interfere with this process and reduce its potential long-term efficiency gains and cost savings, because most ISM repairs are not considered to be reimbursable work. As a result, installations that use civilian employees for these repairs will be penalized, in that they may not have the flexibility in their manpower levels to bid for or accept new COEs. This will prevent more-efficient installations from expanding their repair programs and make less-efficient installations reluctant to give up unused workers

and contract.⁵ Over the long run this will reduce the potential productivity gains from implementation of ISM. Moreover, if the demand rate for repairs increases while the appropriate maintenance activities are fully employed, they will not be able to respond by hiring temporary employees. Accordingly, either the COE repair times will increase or other work will have to be stopped, or both.

Installations such as Fort Riley, which use contracted maintenance, will not face quite the same problem. They will not have a manpower ceiling, but they will have to obtain more contract money from their MACOM before they can accept another COE and additional work. Although this is essentially the same problem (insufficient resources), installation experience has indicated that it is easier to obtain the operating funds than to obtain a waiver from a pay cap or manpower ceiling.

Pay caps and manpower ceilings have been criticized as inflexible and inefficient. Personnel at the installations feel they should be allowed to "manage civilians to budget" (MCB), i.e., have as many government civilians as they need and can afford under an aggregate budget constraint. Pay caps and manpower ceilings, they argue, de facto mandate contracting, while limiting options and flexibility.

Personnel Reductions Under the Pay Cap

Installations have followed a variety of strategies to reduce the number of employees. Voluntary retirement programs (VERA/VSIP) have been offered. Vacancies resulting from voluntary retirements or regular attrition have not always been filled, or have been filled by "temporary" employees who can be dismissed with comparative ease. Many, though not all, installations have also had recent involuntary layoffs or reductions in force (RIFs) of "permanent" government employees.

Unfortunately, government civilian personnel rules (another type of "stovepipe" problem) can offset the cost savings from reducing the number of government employees. As layoffs occur, senior employees can "bump" junior employees from their positions. Cost savings are therefore reduced; the government workforce ages; and the senior employee now in a new job is sometimes not as skilled as his or her predecessor (see U.S. General Accounting Office, 1993).

As noted, the pay caps and manpower ceilings handed to the installations were the result of political pressure to reduce the number of government employees. To the extent there is any economic basis to this movement, it presumably emanates from a belief that the

⁵If an installation gives up employee positions when it loses COEs under ISM, it will have difficulty regaining them in the future and will be less able to bid for new COE work.

costs of government employees are not fully considered by installation decisionmakers. If this is the case, it may be more effective in the long run to change the cost accounting procedures, e.g., to include more fully the future costs of government employee pensions. Improving cost accounting would seem to be considerably more reasonable than exogenously imposed caps on civilian headcount or compensation. To promote efficiency, the maximum possible flexibility and decision power should be given to installations. Installation personnel should be more informed and more able to decide how to operate their garrisons, all other things being equal.

Other Pay Cap Issues

The situation was further complicated because many installation personnel believed that FORSCOM installation civilian pay caps extended to reimbursable work. The latest information we have obtained indicated that this belief is no longer valid. A July 1995 memo from W.D. Stratford of FORSCOM noted that FORSCOM has not yet imposed a reimbursable civilian pay cap or full-time equivalent (FTE) ceiling. It also indicates that FORSCOM will watch reimbursable work and will consider a reimbursable pay cap in the future. Yet, as late as June 1995, we heard FORSCOM installation personnel speak of a FORSCOM cap on reimbursable civilians.

Other pay cap problems could develop from perverse incentives if the major commands impose different types of pay caps on their installations. Installations want repairs done as cheaply as possible. If a pay cap means they cannot do the work themselves, they will explore other options. We were told that if the Training and Doctrine Command (TRADOC) has not imposed caps on reimbursable personnel, the Fort Bragg Directorate of Logistics will consider hiring Fort Jackson, a TRADOC installation, to handle some of Bragg's tent and furniture repair work. Apparently, Jackson may be cheaper than commercial sources. The transfer of reimbursable work from FORSCOM to TRADOC installations was presumably not an intended outcome of the policy. Obviously, if the objective is to reduce the number of people employed by the government, Bragg to Jackson workload transfers have no value.

Finally, if pay caps are applied to reimbursable work, installations will have a disincentive to take on work from tenant activities and AR 5-9 reimbursable work from ARCOMs and other potential customers. AR 5-9 is the Army regulation discussing support of Reserve Component units. AR 5-9 functions range from issuing identification cards to reservists to providing audiovisual training aids to National Guard units. If installations have no incentive to accept AR 5-9 work, that work instead would shift to contractors and

other government agencies, who would possibly be either more expensive or less satisfactory than installation workers.

COE INCENTIVE PROBLEMS

The Centers of Excellence (COEs) developed under the ISM program pose another type of potential problem from misaligned incentives. In our examination of the reengineering plans of the III Corps and XVIII Airborne Corps we found frequent references to large savings from establishment of COEs for reparable exchange (RX) repairs. These savings may be realized for the installations or their units, but may not occur for the Army as a whole.

Installations may reduce their OMA costs by using COEs to repair items instead of returning them to the stock fund and depots for overhaul. This has already generated pressure for the installations to expand their GS repair capabilities into other areas. Apart from creating additional investment and operating costs for facilities, equipment, and possibly personnel (shifted within the limits of the pay cap), this expansion may very well duplicate existing capacity at the depots. If it is displacing repairs that were previously done at depots, rather than displacing procurement, the depots may begin to operate less efficiently and below capacity. Clearly, the potential savings to the individual units and installations may not necessarily be translated into savings for the Army as a whole.

To realize the maximum savings from programs such as ISM, the Army needs to determine how much organic repair capacity it requires and where it is most efficient to have this capacity. Any unused capacity (wherever it may lie) must be eliminated (including the equipment, facilities, and personnel), and the overall efficiency of repair must increase. This may require some difficult decisions at the installation, MACOM, or DA level.

Finally, the COE bidding mechanism creates pressure to reduce repair costs. This will force COEs to adopt a less comprehensive level of repair than they may have been using. Some installations that participated in the ISM-X demonstration reported that they previously often repaired to a standard above IRON (inspect and repair only as necessary), but will now be forced to adopt the strict IRON standard to compete. This change in repair level could eventually lead to more frequent repairs on items as they break down more often. Moreover, if fewer items are procured and returned to the wholesale supply system, fewer new or overhauled items will be entering the inventory. This may exacerbate the breakdown problem.

Alternatively, this approach may be more cost-effective than more comprehensive repairs in the long run. We cannot say at this time how long-term repair frequencies and costs will change. If repair frequency increases, it could translate into either or both lower

readiness and reduced equipment lifetime. FORSCOM and the Army should consider trying to do appropriate serial number tracking to determine the appropriate standard for repairs on an item-by-item basis. Unfortunately, because items often sit on the shelf after repair, and because many RX items do not have serial numbers, this approach may not be useful without significant improvements in Army maintenance and supply data systems.

REIMBURSEMENT RATE PROBLEMS

A final example of potential misaligned incentives can be drawn from the area of reimbursable services within the garrisons. As we noted in Section 3, interinstallation competition might be one way to induce higher-quality services for installations at lower cost. However, increased cross-installation competition may lead to some difficult cost accounting complications. Suppose, for instance, that a directorate had a total cost function (TC) with both fixed costs of operation, F , and marginal costs (costs that increase with the amount of business), c . Then the total cost function would be $TC = F + cQ$, where Q is the quantity or the level of business. An Activity Based Costing (ABC) approach could require that every customer pay average cost (AC) for purchases from the directorate, so the price per unit (e.g., labor hour) would be $P = AC = F/Q + c$.⁶ However, with fixed costs, the maximizing directorate has an incentive to accept any business that is willing to pay anything above short-run marginal cost, c . Way-Smith et al. (1994) argue that this has happened with some DPCAs. They assert, for instance, that the Fort Bliss DPCA has expanded its bailiwick considerably by ignoring short-run fixed or sunk costs.

Of course it is rational for the government to charge long-run marginal costs to customers. However, long-run marginal cost also includes many costs that are fixed in the short run but variable in the long run, e.g., building costs. It is arguably unfair to private-sector firms providing the same services for governmental providers to be charging short-run marginal cost instead of long-run marginal cost.

⁶The Army plans to use ABC to examine the services performed by an organization and identify the activities that are necessary to provide each service. ABC will use Army accounting data to estimate the costs of each activity, then combine this information to calculate the costs of providing each service. Although the total costs of operating a directorate could thus be allocated to the various services that it performs, each activity, and thus each service, would probably still be assigned its average cost.

6. RECOMMENDATIONS AND FUTURE RESEARCH QUESTIONS

REEVALUATE FORSCOM'S ROLE IN MANAGEMENT

We believe that FORSCOM headquarters can perform a valuable role in installation management, but that it may be somewhat different from its customary role. The installations recognize that FORSCOM has a centrally important wartime mission, and acknowledge that it may insulate them from Congress and higher echelons in the Army and defense hierarchy. FORSCOM also serves as an honest broker, such as in the Military Construction Account (MCA) allocation process.

In the past, FORSCOM headquarters has had a day-to-day role in installation management. For example, FORSCOM has participated in detailed budget exercises, contracting processes, and capital outlay decisionmaking. With recent budget cuts and personnel reductions, however, the installations have become concerned that FORSCOM can no longer support the same level of assistance and detailed oversight that it could provide in the past. However, FORSCOM continues to make frequent demands for information and analysis from the installations. As their budgets and personnel resources decrease, the installations have had more trouble meeting these demands while maintaining their own operations at an acceptable level.

In light of these developments, we believe FORSCOM should consider modifying its role with regard to the installations. It should not only continue but expand its effort to reduce the paperwork and reporting demands it places on the installations. Moreover, it should also reevaluate whether it can afford to continue to spend the resources required to review and approve all installation submissions to higher Army headquarters. It may no longer be feasible or desirable for FORSCOM to have a major role in day-to-day installation management. Instead, FORSCOM might best assist installations by making general policy and acting as a facilitator or an advocate, not as a manager.

FORSCOM can significantly increase its value to the installations by becoming more of an information conduit. The ultimate success of reengineering initiatives and requirements to reduce civilian personnel will depend in part on effective communication among installations. We found in our visits that information about many good ideas and successful programs or contract arrangements was not being disseminated well across the installations.

At times, one post would be burdened with a problem for which other posts had found workable solutions. For example, the verification and validation of the IMPAC credit card

charges and bills has been a major problem at Fort Stewart, whose resource management personnel struggled every month to complete this process. Forts Hood and Riley, on the other hand, seemed to have found practical and reasonable approaches to the process and did not consider it a significant problem.

In other cases, installations have not been able to conduct successful A-76 competitions or develop the subsequent contracting arrangements because they had no experience writing the necessary statements of work. We heard more than one example of poorly designed A-76 processes abandoned or contracts renegotiated because the original statements of work were incomplete or incorrect. Although some installations now use the successful contracts developed at other locations as a basis for their own contracts, this has not yet become as widespread as it should.

Given these situations, FORSCOM needs to take a more active role in facilitating information dissemination among installations. Although FORSCOM has set up some processes to do this in the past, these have not worked as well as they should. Accordingly, FORSCOM should make a much greater effort to develop a workable approach to achieve widespread dissemination of information. This type of program will not only improve operations and contracting in the future, but it will also serve to spread the process improvements and other good ideas developed under reengineering initiatives.

To support this reorientation of emphasis, FORSCOM headquarters is not alone as a source of expertise. For instance, the Center for Public Works (CPW) helped Fort Stewart to institute Activity Based Costing and has provided other services, including engineering and design assistance. Similarly, the Army Community and Family Support Center (CFSC) disseminates information across Directorates of Personnel and Community Activities (DPCAs), while the Information Systems Command (ISC) helps Directorates of Information Management (DOIMs). The Fort Riley Directorate of Public Works indicated that it often just consults with private-sector firms when it has engineering design and other problems.

Some installation personnel pointed out that it would help them to evaluate their performance if FORSCOM released comparative data about installation operations and their costs. However, this raises the concern that comparative data could be misinterpreted or misused by FORSCOM to impose "cookie cutter" approaches on installations. As noted, FORSCOM's installations are quite disparate, and the data quality may be questionable, but all could benefit from better information sharing and comparative data if it were provided to them.

PURSUE DECENTRALIZED REENGINEERING

As we discussed above, the decentralized approaches of Installation XXI and the reengineering efforts seem more likely to be successful in the short run than the hub/satellite or centralization approaches.

It is too soon to evaluate the success or failure of the reengineering efforts at any installation, but the decentralized approach being used in the XVIII Airborne Corps seems to be proceeding smoothly, with some promise of at least limited success. As we have discussed, it may be difficult for the Army as a whole to realize the full long-term benefits of any of the reengineering initiatives, so FORSCOM should consider pursuing a follow-up program to investigate some of these initiatives, both to learn whether or not they have been successful and to determine what lessons learned should be passed on to other installations.

Although we have found little enthusiasm for the megainstallation concept under Installation XXI, there could be opportunities for cost savings through centralization of some activities. Interinstallation competition might be one indirect way to achieve such an outcome.

PUSH FOR REVISION OF A-76 PROCESS

The A-76 process can often become lengthy and combative. Empirical evidence suggests that few garrison commanders, especially with their short time horizons, will volunteer to endure the pain of this process. Yet, evidence from Fort Carson and Fort Riley suggests that the competition process may have long-run advantages.

Current Army personnel and budget policy may force the installations to conduct more A-76 competitions. To facilitate and increase the number of such competitions, the FORSCOM commander could directly support (with resources, personnel, or information, if possible) A-76 competitions at installations. These competitions can result in considerable gains, irrespective of whether contractors or government employees win the competition. Installations may not, however, undertake such competition if left to themselves, because of the short-run problems they entail. Alternatively, FORSCOM could push to have the A-76 process streamlined. This would probably require legislative changes, and could meet with considerable resistance.

In this vein, the Commission on Roles and Missions of the Armed Forces has recommended the withdrawal of the A-76 Circular. In their view the DoD should avoid public/private competition where adequate private-sector competition already exists. They also recommend removal of legislative impediments to greater private-sector participation in infrastructure functions, such as prohibitions on outsourcing security and firefighting tasks.

See Commission on Roles and Missions of the Armed Forces (1995). Firefighting, as noted earlier, is an area of considerable expenditures on FORSCOM installations.

ALIGN INCENTIVES WITH POLICY OBJECTIVES

FORSCOM and DA headquarters must be careful that their policies are consistent and do not create perverse incentives. They should also work together to ensure that conflicts in policy among MACOMs and stovepipes do not work to frustrate the long-term goals of the Army as a whole. The civilian pay cap, current budget pressures, and Army financial policies can combine to create perverse incentives in a number of programs, including ISM. These incentives may work to offset overall policy goals. Moreover, potential policy conflicts between such organizations as FORSCOM, TRADOC, and AMC may also create incentives at the installation level that work against individual MACOM goals and the goals of the Army.

To avoid as much of this problem as possible, FORSCOM should examine carefully how its command policies affect installation incentives and how they may interact with similar policies in other parts of the Army. This action could be incorporated into routine reviews of policy decisions, how they are being implemented at the installations, and whether or not they are producing the desired objectives.

ASSIST INSTALLATIONS IN DEALING WITH REGULATIONS

It is encouraging to note that FORSCOM has been given special authority to waive regulations as a Reinvention Center. This should be a primary opportunity for FORSCOM to help its installations operate more efficiently and cost-effectively.

Installations make decisions that ultimately respond to the needs of their customers. An installation will not stop performing a vital function simply because a regulation is waived. Waiving or eliminating regulations will, however, allow installations to eliminate or reduce less important functions if they have to deal with budget reductions.

There are still costly, questionable regulations in effect at the installations. For instance, Fort Hood was storing a large number of obsolete 286 computers, awaiting expiration of a mandated waiting period before disposing of them. We were also told that Managing Civilians to Budget (MCB) training is still required for a number of employees in the garrisons, even though pay caps and personnel ceilings render MCB inoperative.

In many cases, installations are reluctant to implement policies that they see as counterproductive or ill-informed. For example, the Department of Defense mandated that installations have consolidated budget offices. However, many installations feel that having budget officers working directly for directorates facilitates communication, increases efficiency, and builds valuable institutional knowledge and expertise. Some installations

have grudgingly consolidated some of their budget personnel, but others have de facto ignored the mandate and have transferred the personnel on paper only. Given that installations pay the salaries of their budget personnel and understand best how they operate, it seems reasonable to let them decide where and for whom they work.

FORSCOM should look carefully at its regulations and support installations that attempt to get waivers of regulations for valid, thoughtful reasons. They might also consider watching the results of such regulation removals to calibrate whether the programs are progressing appropriately and should be disseminated more widely or, alternatively, ended.

FORSCOM should also consider supporting the installations when thoughtful installation policies seem to conflict with tradition or other regulations. For example, a number of installations have discovered that they were spending far more to audit long-distance phone call costs than they were recovering in phone fraud. Wisely, several installations have gone to less labor-intensive procedures, including random checks, spot checks, "eyeballing" phone bills, and "Top Ten" caller lists. Unfortunately, we can envision a scenario in which someone does abuse phone privileges and is not caught until a later investigation. FORSCOM needs to stand by its installations in circumstances of this sort. It is not reasonable to have to verify every long-distance and cellular phone call, even if this policy leads to some nonzero level of telephone abuse. Economic rationality should be encouraged and supported by FORSCOM in this and other situations.

In this vein, Fort Riley currently has excess capacity in its water treatment plant. Because of recurring water shortages in the area, personnel there have considered selling some of the installation's water to neighboring communities. Sales by installations are not unprecedented, e.g., lumber and grazing rights are sold on a number of installations, and Fort Bragg even sells pine straw from its pine trees. However, the Riley personnel were not entirely sure water sales would be allowed, either legally or by regulation, and they have received no support for this proposal. Assuming such an endeavor would be legal, FORSCOM could help Fort Riley to generate support to implement this effort. FORSCOM could also help the installations to understand Army policies and regulations so as to define more clearly what installations can and cannot do to generate revenue.

LENGTHEN MILITARY TOURS OR MORE CIVILIANIZATION

Installation personnel argue that short time horizons can be a problem for commanding generals and other garrison military personnel. For instance, several individuals at Fort Riley indicated that although the installation has long needed bridge repair, commanding generals have been disinclined to undertake the necessary repairs

because of the cost and disruption during their tours of duty. Increasing installation commander and military director tour durations could lengthen their time horizons and help them make more decisions which lead to short-term costs but long-term benefits.

More generally, short duty tours compound the problems caused by the lack of specific training or experience received by military directors and garrison commanders. This can frequently reduce efficiency at installations. Military personnel have been trained for combat, not installation administration. Even garrison commanders only receive a few months of direct training. Furthermore, military directors frequently churn through installations. We met several military directors on 60-day or 90-day stays in their positions. Very few of the military personnel we met at installations in 1994 were still in the same jobs in 1995. With the elimination of civilian deputies at many installations, these short tours can be difficult for everyone.

Along with longer tours, a garrison career path within the Army might be a reasonable approach. Alternatively, the Army could rely more on civilians, either as directors or deputies. However, we were told that FORSCOM has imposed caps on high-grade civilian employees. As a result, at many installations, civilian deputies to military directors have been eliminated. The high-grade caps would have to be repealed or eased for civilianization of garrison functions to proceed.

ACQUIRE A COST ACCOUNTING SYSTEM

Garrison commanders and their staffs have difficulty managing and operating installations in part because the Army accounting system does not provide activity cost information. Resource analysts must now make a detailed study to determine how much a function costs. As we have shown earlier, however, one can learn some things from the accounting data, e.g., comparative expenditure levels across installations in specific functions. However, such interinstallation comparisons are always challenging because of installation idiosyncrasies, such as Fort Drum's leased utilities and force deployments.

In the absence of a cost accounting system, FORSCOM can still make interinstallation function-by-function cost comparisons to establish benchmarks or goals. Such comparisons may also help the installations recognize inefficient activities and thus increase their operational efficiency and reduce costs.

Because such comparisons must be labor-intensive, however, we recommend that FORSCOM do the following to avoid placing additional burdens on installation staff. First, they should select the most likely candidate functions for this type of benchmarking. These functions may be those, for example, that show high variability across installations with

little explanation. Second, for the selected functions FORSCOM should develop, or hire someone to develop, a relatively direct cost-mapping approach to identify and isolate the significant costs of the function, using the available accounting data. Similar cost allocation procedures have been developed in the past, most recently for the ISM proof of principle and ISM-X demonstration. The procedure for mapping these costs should then be given to the installations so that they need only fill in the blanks or provide the necessary data. With fewer personnel at all levels, it becomes essential that FORSCOM minimize the level of effort needed to make and evaluate such comparisons at every stage of the process.

Unfortunately, the financial data are sometimes nonsensical, e.g., the absence of educational counseling expenditures at Forts Hood and Lewis. Fundamentally, FORSCOM and the installation managers, in particular, must work in the near term to standardize and improve their internal accounting procedures and the quality of their data. In the long run, they must have a cost accounting system. The current accounting system was not designed to generate the costs of activities. Such costs are needed to (1) establish proper reimbursement rates, (2) provide a sound basis for decisionmaking, and (3) permit cost and efficiency comparisons among the installations. Without such a system, FORSCOM and the installations will have more difficulty obtaining the information needed to make the hard choices required to reduce the costs of base operations.

Clearly, the acquisition of a new accounting system is an endeavor quite beyond the purview of FORSCOM alone. However, we believe FORSCOM should push the Army to institute such a change over the long run. A number of private-sector concerns can and have developed accounting systems. We recommend that the Army (and the DoD more generally) consider obtaining a suitable cost accounting system from a commercial source.

FUTURE RESEARCH QUESTIONS

This study has raised a number of important questions that deserve future research. For example, the true costs of installation services remain incompletely understood. Direct expenditure data of the sort we employed omits cost factors like depreciation and capital costs. Hence, leased housing, for instance at Fort Drum or Fort McCoy, is almost certainly not as disproportionately costly as standard data suggest. Acquiring a better accounting system would likely reduce this problem considerably.

Second, suppose the Army and FORSCOM decided to move to more inter-installation competition, as suggested in Section 3. How might this be undertaken, especially in light of Section 5's concerns with the setting of appropriate reimbursement rates? Are there installation services for which competition and reimbursability are particularly well or poorly

suited? What experience do the installations have with obtaining services from competing sources, in or out of the military?

Third, in Section 2 we looked at the costs of Army family housing at the installations and briefly compared these costs to those of providing quarters and housing allowances. This comparison was incomplete, however, because it did not consider the many capital costs and indirect costs of providing family housing on or off post. The Army should investigate all aspects of family housing and the alternatives, to determine over the long run how to develop the most cost-effective housing policy.

Finally, FORSCOM, the Army, or the DoD more generally might wish to consider moving toward a less paternalistic system of providing services. It might be simpler, cheaper, and more effective to compensate military personnel exclusively in cash and have installations divest themselves of government-owned and -operated morale, welfare, and recreation facilities. The costs and benefits of such a major change are obviously unclear and would have to be examined in detail across the spectrum of installations.

Appendix

EXPENDITURE CATEGORIES AND GROUPS

We obtained data by Army Management Structure Code (AMSCO) from the Defense Manpower Data Center. To better understand and present these data, we aggregated the AMSCOs into "groups" and the groups into "categories." Categories roughly correspond to directorates. Tables A.1 through A.7 present the categories, the groups that compose them, and the associated AMSCOs.

Table A.1
Administration Groups and AMSCOs

Group	AMSCO Title	AMSCO
Command Element	Command (Command element/headquarters commandant)	117096NA
	Command (Special garrison staff)	117096NB
	Command (Museums)	117096NC
	Command (Nuclear & chemical)	117096ND
Contracting	Contracting Operations	117096W0
Public Affairs	Public Affairs	43521400
Records	Records and Publications	117096Y0
Resource Management	Resource Management (Director)	117096UA
	Resource Management (Activities)	117096UB
	Resource Management (Finance & accounting)	117096UC
Training	US Army Service Schools	32173120
	Training Support (TDY travel)	32477110
	Training Support (TDY travel - DA directed)	32477140
Training (Civilian)	Army Civilian Training (DA Interns)	33475110
	Army Civilian Training (Leadership center)	33475122
	Army Civilian Training (Executive management)	33475123
	Army Civilian Training (Other leadership training)	33475124
	Army Civilian Training (Senior Executive Service development)	33475125
	Army Civilian Training (Senior service schools)	33475131
	Army Civilian Training (Advanced professional training)	33475141
	Army Civilian Training (Other professional training)	33475143
	Army Civilian Training (Army Civilian Training, Education, and Development System)	33475150

Table A.2

Group	AMSCO Title	AMSCO	
Environment	Environmental Compliance (Ozone depletion)	11705611	
	Environmental Compliance (Asbestos)	11705612	
	Environmental Compliance (Other air quality)	11705613	
	Environmental Compliance (Water quality)	11705620	
	Environmental Compliance (Drinking Water quality)	11705630	
	Environmental Compliance (Hazardous Waste (HW) disposal - Defense Reutilization & Marketing Service)	11705641	
	Environmental Compliance (Other HW disposal)	11705642	
	Environmental Compliance (Other HW compliance)	11705643	
	Environmental Compliance (Underground Storage Tank management)	11705650	
	Environmental Compliance (Solid waste - Resource Conservation and Recovery Act)	11705660	
	Environmental Compliance (Toxics control)	11705670	
	Environmental Compliance (Noise control)	11705681	
	Environmental Compliance (National Environmental Policy Act)	11705682	
	Environmental Compliance (Environmental Compliance Assessment Studies)	11705683	
	Environmental Compliance (Multi-media studies)	11705684	
	Environmental Compliance (Other compliance)	11705685	
	Environmental Compliance (Cultural resources)	117056A0	
	Environmental Compliance (Endangered species)	117056B0	
	Environmental Compliance (Pest management)	117056C0	
	Environmental Compliance (Integrated Training Area Management Land Condition Trend Analysis (ITAM-LCTA))	117056D1	
	Environmental Compliance (Integrated Training Area Management Land Rehabilitation and Maintenance (ITAM-LRAM))	117056D2	
	Environmental Compliance (ITAM - Other)	117056D3	
	Environmental Compliance (Other natural resources)	117056E0	
	Environmental Compliance (Pollution prevention)	117056F0	
	Environment (Personnel and Administration)	Environmental Compliance (Personnel & Administration)	11705691

Table A.3
Housing Groups and AMSCOs

Group	AMSCO Title	AMSCO
Army Family Housing (AFH) (Fire)	Services (Fire) General and Flag Officer Quarters (GFOQ)	19121200
	Services (Fire)	19122200
AFH (Furnishing)	Furnishings (Control/moving furniture) GFOQ	19131100
	Furnishings (Furniture maintenance) GFOQ	19131200
	Furnishings (Furniture purchases) GFOQ	19131300
	Furnishings (Equipment maintenance) GFOQ	19131500
	Furnishings (Equipment purchases) GFOQ	19131600
	Furnishings (Control/moving furniture)	19132100
	Furnishings (Furniture maintenance)	19132200
	Furnishings (Furniture purchases)	19132300
	Furnishings (Equipment maintenance)	19132500
	Furnishings (Equipment purchases)	19132600
	Furnishings (Control/moving equipment)	19132A00
AFH (Maintenance)	Maintenance (Exterior utilities)	19241000
	Maintenance (Grounds) GFOQ	19251100
	Maintenance (Surfaced areas) GFOQ	19251200
	Maintenance (Other) GFOQ	19251300
	Maintenance (Grounds)	19257100
	Maintenance (Surfaced areas)	19257200
	Maintenance (Other)	19257300
	Maintenance (Environmental compliance)	19257800
	Self-Help (Dwellings)	19260100
	Self-Help (Other real property)	19260200
	Maintenance (Minor)	19420100
	Maintenance (Major projects)	19420300
	Maintenance (Grounds)	19420500
	Maintenance (Surfaced areas)	19420600
	Maintenance (Other real property)	19420700
AFH (Management)	Management (Family housing office) GFOQ	19111100
	Management (Indirect support) GFOQ	19111200
	Management (Programming/studies) GFOQ	19111400
	Management (Environmental studies) GFOQ	19111800
	Management (Family housing office)	19112100
	Management (Indirect support)	19112200
	Management (Programming/studies)	19112400
	Management (Environmental studies)	19112800
AFH (Operations)	Operations (Management)	19410100
	Operations (Services)	19410200
	Operations (Furnishings)	19410300
	Operations (Programming/studies)	19410400
AFH (Other)	Miscellaneous (Permit payments)	19140100
	Corps of Engineer Costs	19450000

Table A.3—Continued

Group	AMSCO Title	AMSCO
AFH (Other)	Miscellaneous (Permit payments)	19140100
	Corps of Engineer Costs	19450000
	Services (Entomology)	19122400
AFH (Police)	Services (Police) GFOQ	19121300
	Services (Police)	19122300
AFH (Projects)	Major Projects GFOQ	19221100
	Major Projects	19223100
	Major Projects (Environmental compliance)	19223800
	Major Projects (Mobile homes/other)	19226100
	Alterations GFOQ	19231100
	Alterations	19233100
	Alterations (Other real property)	19236300
	Design GFOQ	19271000
	Design	19272000
AFH (Real Property Maintenance)	RPM (Recurring) GFOQ	19211100
	RPM (Between occupancy cleaning) GFOQ	19211200
	RPM (Recurring)	19213100
	RPM (Between occupancy cleaning)	19213200
	RPM (General charges)	19217000
AFH (Refuse)	Services (Refuse)	19121100
	Services (Refuse)	19122100
AFH (Services)	Services (Custodial) GFOQ	19121500
	Services (Custodial)	19122500
	Services (Indirect Support)	19122700
AFH Leases	Lease Payments (Government Rental Housing Program)	19441000
	Lease Payments (Other)	19449000
AFH Utilities (Electricity)	Utilities (Electricity) GFOQ	19311000
	Utilities (Electricity)	19312000
	Utilities (Electricity - mobile homes/other)	19316000
	Utilities (Electricity)	19430100
AFH Utilities (Gas)	Utilities (Gas) GFOQ	19321000
	Utilities (Gas)	19322000
	Utilities (Gas - mobile homes/other)	19326000
	Utilities (Gas)	19430200
AFH Utilities (Oil)	Utilities (Fuel oil) GFOQ	19331000
	Utilities (Fuel oil)	19332000
AFH Utilities (Other)	Utilities (Connection - mobile homes/other)	
	Utilities (Other)	19372000
	Utilities (Other - mobile homes/other)	19376000
	Utilities (Other/fuel)	19430700

Table A.3—Continued

Group	AMSCO Title	AMSCO
AFH Utilities (Water/Sewer)	Utilities (Water) GFOQ	19341000
	Utilities (Water)	19342000
	Utilities (Water - mobile homes/other)	19346000
	Utilities (Sewage) GFOQ	19351000
	Utilities (Sewage)	19352000
	Utilities (Sewage - mobile homes/other)	19356000
	Utilities (Water)	19430400
	Utilities (Sewage)	19430500

Table A.4

Information Management Groups and AMSCOs

Group	AMSCO Title	AMSCO
Audiovisual	Audiovisual Information	11709000
	Audiovisual Services	32579000
	Audiovisual Services	33679000
Automation	Automation Activities	117096P0
	Information Management - Automation Support	43261200
	Automation Acquisition Management & Support (Managers)	43261500
	Information Management - Automation Support	43561200
Automation (Training Support)	Information Program Management	11261100
	Information Management - Automation	11261200
Communications	Base Communications	11709500
	Base Communications	33679500
	Base Communications (Administration)	43829500

Table A.5

Logistics Groups and AMSCOs

Group	AMSCO Title	AMSCO
Food Service	Food Service (Bakeries/milk plants/ration plants)	117096FA
	Food Service (Kitchen Patrols)	117096FB
	Food Service (Cooks)	117096FC
	Food Service (Full contract operation)	117096FD
	Food Service (Decorations/equipment)	117096FE
	Food Service (Other facilities)	117096FF
Laundry	Laundry Services	117096E0
Maintenance (Non-Tactical Equipment)	Direct and General Support (DS/GS) Maintenance (Administration/operation support aircraft)	117096CA
	DS/GS Maintenance (Army nontactical vehicles)	117096CB
	DS/GS Maintenance (Construction equipment)	117096CC
	DS/GS Maintenance (Electronic & communication equipment)	117096CD

Table A.5—Continued

Group	AMSCO Title	AMSCO
Reserve Support	DS/GS Maintenance (Unaccompanied personnel housing furniture)	117096CE
	DS/GS Maintenance (Other commodity group)	117096CF
	Reserve Support	117096Q0
	Administrative Support (Independent ready reserve mobilization)	43609980
	Base Operations	51589600
	Reserve Readiness Support (ARCOMs)	51999210
	Reserve Readiness Support (USAR center)	51999220
	Reserve Readiness Support (Army readiness groups)	51999231
	Reserve Readiness Support (Army readiness advisors)	51999232
	Reserve Readiness Support (Reserve readiness support)	51999240
	Reserve Readiness Support (Annual training evaluation)	51999251
	Reserve Readiness Support (Overseas deployment training support)	51999252
	Reserve Readiness Support (Over-40 medical screening)	51999253
	Reserve Readiness Support (HIV testing)	51999254
	Reserve Readiness Support (Other training support)	51999255
	Reserve Readiness Support (CAPSTONE-NG)	51999261
	Reserve Readiness Support (CAPSTONE-AR)	51999262
Resources	Logistic Support Activity (Attendant central supply services)	42301211
	Logistic Support Activity (Timber management)	42301226
	Logistic Support Activity (Administrative expenses of agriculture/grazing)	42301228
	Logistic Support Activity (Other)	42301229
Supply	Supply (Military clothing sales)	117096BA
	Supply (Other operations)	117096BC
Supply (Central Issue Facility)	Supply (Central Issue Facility facilities)	117096BB
Supply (DOL)	Supply (DOL office)	117096BD
Supply (TISA)	TISA (Administrative support)	42389210
	TISA (Operations)	42389220
Transportation	Transportation (Non-General Services Administration (GSA))	117096DA
	Transportation (GSA services)	117096DC
	Transportation (Movement of household goods)	117096DD
	Transportation (New equipment to units)	42101011
	Transportation (Direct equipment redistribution)	42101012
	Transportation (TOE equipment moves)	42101013
	Transportation (Army cargo moves)	42101015
	Base Operations (Non-GSA transportation)	438896DA
Transportation (Installation Transportation Office)	Transportation (ITO operations)	117096DB

Table A.6
Personnel and Community Affairs Groups and AMSCOs

Group	AMSCO Title	AMSCO
Bowling	Community/Morale Welfare Recreation (MWR) (Bowling > 12 lanes)	117096SC
	Community/MWR (Bowling <= 12 lanes)	117096SQ
Child Development	Child Development (Centers)	11771921
	Child Development (Education program)	11771922
	Child Development (School-age/latch key)	11771923
	Child Development (Family child care)	11771924
	Child Development (Base & supplemental programs)	11771925
	Child Development (AMC/MTMC/COE)	43871925
Drugs	Drug Abuse Prevention & Control	43471410
	Drug Screening & Testing	43471420
	Counter Drug (Mission training)	4347611D
	Counter Drug (Student TDY)	4347611E
	Counter Drug (Civilian employee training)	43476190
	Drug Abuse Prevention (OSD program)	43478900
Education	Army Continuing Education Services (ACES) (On-duty programs)	33373210
	ACES (Off-duty programs)	33373220
	ACES (Army learning center)	33373230
	ACES (Army education center)	33373240
	ACES (Army personnel testing)	33373270
	Army Career Alumni Program	43473400
Education (Administration)	ACES (Management/administration)	33373250
Education (Counseling)	ACES (Counseling)	33373260
Family Programs	Family Centers (Army Community Services (ACS)) (Exceptional members)	11772011
	Family Centers (ACS) (Family advocacy)	11772012
	Family Centers (ACS) (Member employment)	11772013
	Family Centers (ACS) (Financial planning)	11772015
	Family Centers (ACS) (Information/referral services)	11772016
	Family Centers (ACS) (Outreach)	11772017
	Family Centers (ACS) (Relocation)	11772018
	Family Centers (ACS) (ACS services)	11772019

Table A.6—Continued

Group	AMSCO Title	AMSCO
Golf	Community/MWR (Golf)	117096SF
Libraries	Community/MWR (Libraries)	117096SK
MWR/Community	Community/MWR (Information, travel & recreation)	117096SD
	Community/MWR (Arts & crafts)	117096SE
	Community/MWR (Entertainment)	117096SI
	Community/MWR (Community support)	117096SJ
	Community/MWR (Auto crafts)	117096SM
	Community/MWR (Clubs)	117096SN
	Community/MWR (Recreation centers)	117096SP
Personnel	Personnel (Other personnel support)	117096GF
	Other Personnel Activities (Miscellaneous)	43471620
	Disposition of Remains/Kin Travel	43471640
	Personnel Claims (Military & civilian personnel)	43609911
Personnel (Civilian)	Personnel (Civilian personnel)	117096GC
Personnel (DCA)	Personnel (DPCA staff)	117096GA
Personnel (Drugs)	Personnel (Alcohol/drug abuse)	117096GB
Personnel (Military)	Personnel (Military personnel)	117096GD
Preserve Order	Preserve Order (Director/Provost Marshal)	117096TA
	Preserve Order (Activities)	117096TB
	Preserve Order (Correction operations - OCONUS)	117096TC
	Preserve Order (Security/ counterintelligence)	117096TD
	Preserve Order (Correction operations - CONUS)	117096TE
	Correctional Facilities	43470700
Recruiting	Personnel Procurement (Advertising)	33171210
	Personnel Procurement (Advertising - cadets)	33171220
	Personnel Procurement (Recruiting data processing)	33171500
Sports	Community/MWR (Sports above intramural)	117096SB
	Community/MWR (Army sports program)	117096SH
	Community/MWR (Outdoor recreation)	117096SL
Youth Activities	Community/MWR (Youth development)	117096S1
	Community/MWR (Youth leisure/social recreation)	117096S2
	Community/MWR (Youth physical fitness)	117096S3
	Community/MWR (Youth school-age/latch key)	117096S4
	Community/MWR (Youth services management)	117096S5

Table A.7
Public Works Groups and AMSCOs

Group	AMSCO Title	AMSCO
Demolition	Engineer Support (Demolition)	117096M6
Engineer Services	Engineer Support (Installation services)	117096M2
	Engineer Support (Management & engineering)	117096M4
	Engineer Support (Real estate/construction administration)	117096M5
	Engineer Support (Miscellaneous activities)	117096M7
	Engineer Support (Equip-in-place operations)	117096M8
Fire Prevention	Engineer Support (Fire prevention)	117096M1
Leases	Leases (Nonrecruiting)	117096AB
	Real Estate Leases	438396AB
Maintenance (Real Property Management)	Maintenance & Repair (Operation & training facilities)	117078K1
	Maintenance & Repair (Maintenance & production facilities)	117078K2
	Maintenance & Repair (Supply facilities)	117078K3
	Maintenance & Repair (Medical facilities)	117078K4
	Maintenance & Repair (Administrative facilities)	117078K5
	Maintenance & Repair (Troop housing facilities)	117078K6
	Maintenance & Repair (Community facilities)	117078K7
	Maintenance & Repair (Utilities/ground/other)	117078K8
	Maintenance & Repair (Commissaries)	117078K9
	Maintenance & Repair (Research Development Test and Evaluation)	117078KC
Minor Construction	Minor Construction (Alterations - active)	117076L1
Refuse	Engineer Support (Refuse handling)	117096M3
Unaccompanied Personnel (UAP) Housing	Unaccompanied Personnel (UAP) Housing (Issue of furnishings)	117096HA
	UAP Housing (Operations)	117096HB
	UAP Housing (Leased housing)	117096HC
Utilities	Utilities (Other operations)	117096J6
Utilities (Air Conditioning)	Utilities (Air conditioning & cold storage)	117096J4
Utilities (Boiler)	Utilities (Boiler/heating plants)	117096J3
Utilities (Electricity)	Utilities (Electrical services)	117096J2
Utilities (Purchase)	Utilities (Purchased)	117096J5
Utilities (Water/Sewer)	Utilities (Water/sewage services)	117096J1

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